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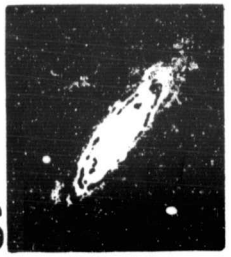

78-01

National Space Science Data Center/
World Data Center A For Rockets and Satellites

(NASA-TM-79397) CATALOG OF VIKING MISSION DATA (NASA) 41 p HC A03/MF A01 CSCI 22A

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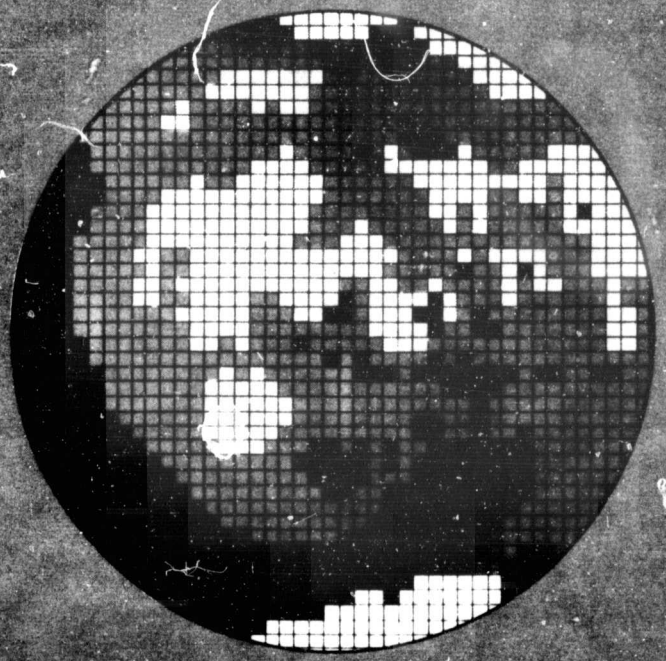
Catalog of Viking Mission Data



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May 1978

DEFINITIONS OF DISCIPLINES

ASTRONOMY – This category includes all observations of astronomical objects, both outside and within the solar system, made at various wavelengths (i.e., gamma rays through radio waves). Observed objects outside the solar system include stars, nebulae, galaxies, and all other matter. Observed objects within the solar system include zodiacal light sources, meteoroids, asteroids, dust, micrometeorites, and planetary radio emission sources. Other planetary observations (see Planetary Atmospheres, Planetology, or Ionospheric Physics) and solar observations (see Solar Physics) are excluded. Observations of cosmic-ray particles are listed under Particles and Fields. Celestial mechanics measurements are included under Geodesy and Gravimetry.

GEODESY AND GRAVIMETRY – This category includes experiments that measure size, shape, mass, coordinates, altitudes, or gravity fields or experiments concerned with the mapping of a body. It includes the mechanics of orbiting artificial and natural bodies.

IONOSPHERIC PHYSICS – This category includes observations of the ionosphere, which is defined as that region of a planetary atmosphere which contains a significant number of free thermal electrons on a daily basis and which has a free electron density maximum in the vertical direction. Its upper and lower extents are roughly defined as the areas in which densities approach 10^{-4} of the peak values. Included are all in situ and remotely sensed observations of ionospheric charged particles with thermal energies. This category is used for remotely sensed propagation experiments that primarily focus on the ionosphere, including very low frequency (VLF) and extremely low frequency (ELF) experiments; for other remotely sensed propagation experiments, an appropriate category, such as Particles and Fields, is used.

METEOROLOGY – This category includes observations made in the Earth's hydrosphere and atmosphere up to the mesopause or D region.

PARTICLES AND FIELDS – The subcategory Particles includes all in situ charged-particle measurements except those of thermal plasma in terrestrial or other planetary ionospheres (see Ionospheric Physics). It includes all neutron measurements and electromagnetic signal propagation experiments designed to measure columnar electron densities (except those in which the most significant portion of the free electrons within the column is within an ionosphere). The subcategory Fields includes all in situ measurements of electric and magnetic fields. It includes VLF and ELF experiments other than those primarily concerned with observing ionospheric properties. It excludes electromagnetic radiation (radio waves through gamma waves) propagating away from remote sources. (In such cases, either Solar Physics or Astronomy is used, as appropriate.)

PLANETARY ATMOSPHERES – This category includes all observations of the gaseous envelope above the surface of a planet. For the Earth the lower limit for observations that belong in this category is about 65 km, the height of the mesopause or D region. (For studies below this altitude, Meteorology is used.) The upper limit is defined as the transition level to the lightest gas. This region overlaps the ionosphere for planets which have an ionosphere; however, ionospheric observations are restricted to observations related to the charge aspects of matter, while Planetary Atmospheres relates to the mass aspects of matter (e.g., composition measurements). For cases in which both atmospheric and ionospheric categories apply, both may be used.

PLANETOLOGY – This category includes experiments for the purpose of deriving and analyzing data from the solid or liquid parts (excluding the oceans of the Earth) of any solar system body. Chemical, physical, and geologic studies of properties of gross or small surface features, materials of the surface, internal properties, magnetic properties, etc., are included. Gravitational and geodetic experiments are excluded from this category (see Geodesy and Gravimetry). When the primary purpose of the study is to measure the residual effects of some external phenomena (such as meteorite or cosmic-ray impacts), the external phenomena should determine the choice of category. If necessary, the experiment may be assigned to more than one category.

SOLAR PHYSICS – This category includes all solar observations regardless of the wavelength being observed. The source region considered here extends outward from the Sun to include that area observed with solar coronagraphs (nominally to 10 solar radii). All in situ measurements of electric or magnetic fields and of particles for which the source is believed to be the Sun are considered to fall in the domain of Particles and Fields.

NSSDC/WDC-A-R&S 78-01

CATALOG OF VIKING MISSION DATA

edited by

Robert W. Vostreys

May 1978

National Space Science Data Center (NSSDC)/
World Data Center A for Rockets and Satellites (WDC-A-R&S)
National Aeronautics and Space Administration
Goddard Space Flight Center
Greenbelt, Maryland 20771

PREFACE

This document was produced through the efforts of many people. Outstanding among them are the personnel at the National Space Science Data Center (NSSDC), the Viking Project personnel at the Jet Propulsion Laboratory, and those investigators who have provided data. My thanks to all of them.

NSSDC strives to serve the scientific community in a useful manner so that the data deposited can be disseminated for continued and further analysis. Scientists are invited to submit comments or recommendations regarding the format of this *Catalog*, the data announced herein, and the services provided by NSSDC. Recipients are urged to inform others of its availability.

Robert W. Vostreys

CONTENTS

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	Page
PREFACE	iii
INTRODUCTION	1
DATA DESCRIPTIONS	3
Viking 1 Orbiter	4
Orbiter Imaging (75-075A-01)	4
Infrared Thermal Mapping (IRTM) (75-075A-02)	6
Mars Atmospheric Water Detection (MAWD) (75-075A-03)	6
Orbiter Radio Science (75-075A-04)	6
Viking 1 Lander	7
Physical Properties (75-075C-01)	7
Entry Science Atmospheric Structure (75-075C-02)	7
Biology (75-075C-03)	7
Molecular Analysis (75-075C-04)	8
Lander Imaging (75-075C-06)	8
Meteorology (75-075C-07)	10
Magnetic Properties (75-075C-10)	10
Lander Radio Science (75-075C-11)	11
Entry Science Neutral Atmospheric Composition (75-075C-12)	11
Inorganic Analysis (75-075C-13)	11
Entry Science Ionospheric Properties (75-075C-14)	12
Viking 2 Orbiter	12
Orbiter Imaging (75-083A-01)	13
Infrared Thermal Mapping (IRTM) (75-083A-02)	14
Mars Atmospheric Water Detection (MAWD) (75-083A-03)	15
Orbiter Radio Science (75-083A-04)	15
Viking 2 Lander	15
Physical Properties (75-083C-01)	16
Entry Science Atmospheric Structure (75-083C-02)	16
Biology (75-083C-03)	16
Molecular Analysis (75-083C-04)	16
Lander Imaging (75-083C-06)	17
Meteorology (75-083C-07)	18
Seismology (75-083C-08)	19
Magnetic Properties (75-083C-10)	19
Lander Radio Science (75-083C-11)	20
Entry Science Neutral Atmospheric Composition (75-083C-12)	20

CONTENTS (concluded)

	Page
Inorganic Analysis (75-083C-13)	21
Entry Science Ionospheric Properties (75-083C-14)	21
INVESTIGATOR NAME INDEX	23
APPENDIXES	29
Appendix 1 - NSSDC Facilities and Ordering Procedures	29
Appendix 2 - Abbreviations and Acronyms	35

INTRODUCTION

THE VIKING PROGRAM

The two Viking missions to Mars each consisted of an Orbiter and a Lander. Viking 1 was launched on August 20, 1975, and was inserted into an areocentric orbit on June 19, 1976. The Viking 1 Lander touched down in the Chryse region at a latitude of 22.27°N and a longitude of 47.94°W on July 20, 1976. Viking 2 was launched on September 9, 1975, and was inserted into an areocentric orbit on August 7, 1976. The Viking 2 Lander touched down in the Cydonia region at a latitude of 47.67°N and a longitude of 225.71°W on September 3, 1976. The primary mission for the two Vikings lasted until November 8, 1976, and an extended mission lasted until May 1978 (1 full Martian year). A continued mission is expected to last until March 1, 1979.

Both Vikings carried identical instrumentation and experiments. With the exception of the seismometer on board the Viking 1 Lander, which failed to uncage, all experiments functioned satisfactorily. The Orbiters carried instrumentation for imaging, radio science, thermal mapping, and water vapor detection. The Landers measured characteristics of the Martian atmosphere from the time they separated from the Orbiters until they touched down on the Martian surface. Then, on the surface, Lander instrumentation was utilized for biology, imagery, meteorology, organic and inorganic chemistry, physical properties, magnetic properties, radio science, and seismology investigations.

NSSDC MISSION

The purpose of the National Space Science Data Center (NSSDC) is to be the repository of space science data and the distributor of these data to the scientific community. To organize and systematize the volume of data received, NSSDC has a computerized file that maintains information on spacecraft, experiments flown on the spacecraft, and data stored at NSSDC from those experiments. For filing purposes, these records are each given identification numbers (NSSDC ID's) utilizing a spacecraft/experiment/data set hierarchy. Data are ordered from NSSDC by these numbers.

NSSDC has reproduction services, data viewing resources, and personnel to assist scientists in procuring the desired data products. In order to acquaint the user public with the data products stored at NSSDC, the Data Center publishes catalogs and other types of documents.

CATALOG ORGANIZATION

NSSDC publishes catalogs of data for the disciplines described on the inside front cover. The purpose of this *Catalog* is to announce the present/expected availability of scientific data acquired by the Viking missions. This *Catalog* contains descriptions of the Viking spacecraft, experiments, and data sets. An index is included that lists the team leaders and team members for the experiments. There are also two appendixes: information on NSSDC facilities and ordering procedures, and a list of acronyms and abbreviations.

DATA DESCRIPTIONS

This section contains descriptions of the Viking spacecraft, experiments, and data sets obtained from the NSSDC information system. Because NSSDC is receiving Viking data on a continuing basis, experiment and data set descriptions are included where data are scheduled to become available through NSSDC in the future. This *Catalog*, for the most part, contains descriptions of primary mission data; some extended mission data are also included.

The descriptions are organized by spacecraft in the following order: Viking 1 Orbiter (NSSDC ID 75-075A), Viking 1 Lander (NSSDC ID 75-075C), Viking 2 Orbiter (NSSDC ID 75-083A), and Viking 2 Lander (NSSDC ID 75-083C). As mentioned previously, the NSSDC ID is a code used to identify spacecraft, experiments, and data sets. Spacecraft ID's are appended with an experiment sequence number (e.g., 75-075A-01) and a data set sequence letter (e.g., 75-075A-01A). Each spacecraft, experiment, and data set entry is composed of two parts: a heading and a brief description. The spacecraft heading includes selected orbit parameters for the Viking Orbiter spacecraft. In addition, the heading includes the launch date, spacecraft common name, the NSSDC ID code, and spacecraft personnel. Spacecraft personnel for the Viking missions include the program manager (MG), program scientist (SC), project manager (PM), and project scientist (PS). The experiment heading includes the NSSDC experiment name, the NSSDC ID code, and the names and affiliations of the team leader (TL) and team members (TM) associated with the experiment. The data set heading includes the time period covered by the data (when available and verifiable), the quantity of data and the medium on which they are stored, and an indicator describing the availability of the data. The indicators used to describe the availability status of Viking data are:

- "Data at NSSDC Being Processed" -- identifies data sets for which documentation and verification activities are in process. These data are usually sufficiently documented and verified to satisfy routine requests.

- "Data Identified but not Received" -- identifies data sets that are not yet available at NSSDC, but for which descriptive information is available.

- "Data in Published Reports" -- indicates that the data are contained in a published report or journal, or that the only accessible source of any reduced data from an experiment is the published document.

****

SPACECRAFT COMMON NAME- VIKING 1 ORBITER

NSSDC ID- 75-075A

LAUNCH DATE- 08/20/75

ORBIT PARAMETERS

ORBIT TYPE- AREOCENTRIC	EPOCH DATE- 06/21/76
ORBIT PERIOD- 1479. MIN	INCLINATION- 37.9 DEG
PERIAPSIS- 1513. KM	APOAPSIS- 32600. KM

PERSONNEL

MG - W.	JAKOBOWSKI	NASA HEADQUARTERS
SC - R.S.	YOUNG	NASA HEADQUARTERS
PM - K.S.	WATKINS	NASA-JPL
PS - C.W.	SNYDER	NASA-JPL

BRIEF DESCRIPTION

THE VIKING SPACECRAFT CONSISTED OF AN ORBITER AND A LANDER. THE LANDER SEPARATED FROM THE ORBITER, ENTERED THE MARTIAN ATMOSPHERE, AND SOFT-LANDED JULY 20, 1976. SCIENTIFIC DATA WERE COLLECTED AND TRANSMITTED TO EARTH FROM THE LANDER DURING ENTRY AND WHILE IT WAS ON THE SURFACE, AND FROM THE ORBITER BEFORE AND AFTER LANDER SEPARATION. THE ORBITER WAS A SOLAR-CELL-POWERED SATELLITE STABILIZED IN THREE AXES USING INERTIAL AND CELESTIAL REFERENCES. THERE WAS A 500-W POWER CAPACITY FOR THE ORBITER. IT CARRIED INSTRUMENTS FOR CONDUCTING IMAGING, ATMOSPHERIC WATER VAPOR, THERMAL MAPPING, AND RADIO SCIENCE INVESTIGATIONS. THE SCIENTIFIC AND PHOTOGRAPHIC ANALYSIS INSTRUMENTS HAD A MASS OF APPROXIMATELY 72 KG (158 LB).

****

INVESTIGATION NAME- ORBITER IMAGING

NSSDC ID- 75-075A-01

PERSONNEL

TL - M.H.	CARR	US GEOLOGICAL SURVEY
TM - W.A.	BAUM	LOWELL OBSERVATORY
TM - H.	MASURSKY	US GEOLOGICAL SURVEY
TM - G.A.	BRIGGS	NASA-JPL
TM - J.A.	CUTTS	SCIENCE APPL, INC
TM - T.C.	DUXBURY	NASA-JPL
TM - K.R.	BLASIUS	PLANETARY SCIENCE INST
TM - R.	GREELEY	ARIZONA STATE U
TM - J.E.	GUEST	U OF LONDON
TM - K.A.	HOWARD	US GEOLOGICAL SURVEY
TM - B.A.	SMITH	U OF ARIZONA
TM - L.A.	SODERBLOM	US GEOLOGICAL SURVEY
TM - J.	VEVERKA	CORNELL U
TM - J.P.	WELLMAN	NASA-JPL

BRIEF DESCRIPTION

THE VIKING VISUAL IMAGING SUBSYSTEM (VIS) CONSISTED OF TWIN HIGH-RESOLUTION, SLOW-SCAN TELEVISION FRAMING CAMERAS MOUNTED ON THE SCAN PLATFORM OF EACH ORBITER WITH THE OPTICAL AXES OFFSET BY 1.38 DEG. EACH OF THE TWO IDENTICAL CAMERAS ON EACH ORBITER HAD A 475-MM FOCAL LENGTH TELESCOPE; A 37-MM DIAMETER VIDICON, THE CENTRAL SECTION OF WHICH WAS SCANNED IN A RASTER FORMAT OF 1056 LINES BY 1182 SAMPLES; AND SIX COLOR FILTERS TO RESTRICT THE SPECTRAL BANDPASS OF AN IMAGE TO LIMITED PORTIONS OF THE CAMERAS' NEAR-VISUAL RESPONSE CHARACTERISTICS. EACH FIELD OF VIEW WAS 1.54 DEG X 1.69 DEG WITH EACH PICTURE ELEMENT (PIXEL) SUBTENDING 25 MICRORADIANS. THE SLIGHT OFFSET OF THE OPTICAL AXES AND THE ALTERNATE SHUTTERING MODE OF OPERATION (THE INTERVAL BETWEEN FRAMES BEING 4.48 S) PROVIDED OVERLAPPING, WIDE-SWATH COVERAGE OF THE SURFACE. INDIVIDUAL IMAGES ARE IDENTIFIED BY PICTURE NUMBER (PICNO), WHICH IS A UNIQUE IDENTIFIER OF THE SCENE. ELEMENTS OF THE PICNO ARE AS FOLLOWS: THE FIRST THREE DIGITS DENOTE THE REVOLUTION (REV) DURING WHICH THE IMAGE WAS SHUTTERED; THE LETTER A IS VIKING ORBITER 1, B IS VIKING ORBITER 2; AND THE LAST TWO DIGITS ARE THE FRAME NUMBER.

****

DATA SET NAME- B/W PRESS RELEASE PHOTOGRAPHY

NSSDC ID- 75-075A-01A

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 06/23/76 TO 02/20/77

QUANTITY OF DATA- 46 FRAMES

BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF 4- X 5-IN. B/W NEGATIVES THAT WERE RELEASED BY THE PROJECT FOR PUBLIC DISTRIBUTION. SOME ARE INDIVIDUAL FRAMES OR MOSAICS OF POTENTIAL LANDING SITES TAKEN EARLY IN THE MISSION. THE REST WERE CHOSEN TO SHOW FEATURES OF PARTICULAR INTEREST. DESCRIPTIONS OF EACH PHOTOGRAPH ARE INCLUDED.

****

DATA SET NAME- COLOR PRESS RELEASE PHOTOGRAPHY

NSSDC ID- 75-075A-01D

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 06/12/76 TO 06/25/76

QUANTITY OF DATA- 7 FRAMES

BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF 4- X 5-IN. COLOR NEGATIVES RELEASED BY THE PROJECT FOR PUBLIC DISTRIBUTION. BECAUSE OF COLOR INACCURACIES IN REPRODUCTION, THE COLORING CANNOT BE CONSIDERED ACCURATE. IT IS NOT POSSIBLE TO REPRODUCE ACCURATELY THE RED SPECTRAL RANGE THAT WOULD BE PERCEIVED BY THE HUMAN EYE, BECAUSE OF A LACK OF ADEQUATE DATA FOR WAVELENGTHS GT 650 NM.

****

DATA SET NAME- B/W RECTILINEAR PHOTOGRAPHY

NSSDC ID- 75-075A-01B

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 06/22/76 TO 05/13/77

QUANTITY OF DATA- 12843 FRAMES

BRIEF DESCRIPTION

THESE DATA, SUPPLIED BY THE ORBITER IMAGING TEAM, ARE ON 5- X 5-IN. B/W FILM AND REPRESENT THE SURFACE AS VIEWED FROM THE ORBITER SCAN PLATFORM WITHOUT GEOMETRIC CORRECTIONS FOR OBLIQUE-VIEWING DISTORTION. MOST IMAGES ARE AVAILABLE IN TWO PROCESSED VERSIONS: (1) THE SHADING CORRECTED (SCR2) VERSION, SUITABLE FOR ALBEDO CONTRAST AND PHOTOGRAMMETRIC STUDIES; AND (2) THE HIGH-PASS FILTERED (NGF) VERSION, WHICH PROVIDES MAXIMUM FEATURE DISCRIMINABILITY (AT THE COST OF TRUE ALBEDO CONTRAST). BOTH VERSIONS HAVE BEEN PROCESSED TO REMOVE OR FILL IN TELEMETRY BIT ERRORS, CAMERA BLEMISHES, AND NONUNIFORMITIES IN VIDICON RESPONSE. CORRECTED DATA ARE THEN LINEARLY STRETCHED IN CONTRAST TO FILL THE DYNAMIC RANGE OF THE FILM. EACH PROCESSED PICTURE HAS A DATA BLOCK CONTAINING ALL PERTINENT INFORMATION FOR THE IMAGE. TO SELECT THESE DATA, USE THE SEDR (75-075A-01E); THE RECTILINEAR AND ORTHOGRAPHIC PHOTOGRAPHY INDEX (75-075A-01L); THE QUADRANT, LATITUDE, AND LONGITUDE INDEX (75-075A-01M); OR THE 10-DEG BOX INDEX (75-075A-01I). IN ORDERING, SPECIFY BOTH THE PICNO AND THE ROLL/FILE NUMBER.

****

DATA SET NAME- B/W ORTHOGRAPHIC PHOTOGRAPHY

NSSDC ID- 75-075A-01C

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 07/23/76 TO 05/13/77

QUANTITY OF DATA- 3682 FRAMES

BRIEF DESCRIPTION

THESE DATA, SUPPLIED BY THE ORBITER IMAGING TEAM, ARE ON 5- X 5-IN. B/W FILM AND ARE A SUBSET OF THE TOTAL IMAGE SET THAT HAS BEEN TRANSFORMED TO AN ORTHOGRAPHIC MAPPING PROJECTION SO THAT THE SCENE APPEARS AS IF VIEWED FROM DIRECTLY OVERHEAD. THE CENTER OF PROJECTION IN ALL CASES IS THE CENTER POINT OF THE FRAME. TO PRESERVE MAXIMUM DISCRIMINABILITY OF FEATURES, THE SIZE OF THE PROJECTED IMAGE IS FORMATTED TO FILL, AS NEARLY AS POSSIBLE, THE MASK DIMENSIONS (1584 PIXELS SQUARE). THEREFORE, THE SCALE WILL VARY FROM IMAGE TO IMAGE IN A SERIES. THIS IS ESPECIALLY EVIDENT IN THOSE SEQUENCES OBTAINED AT PERIAPSIS WHEN THE VIEWING GEOMETRY AND RANGE ARE CHANGING MOST RAPIDLY. THE SCALE OF EACH IMAGE IS GIVEN IN THE DATA BLOCK UNDER SCO (KM/PIXEL). A SCALE BAR TO THE RIGHT OF THE IMAGE FACILITATES PHOTOGRAPHIC RECONSTRUCTION OF A SERIES OF IMAGES TO A SIMILAR SCALE. NOT ALL IMAGES ARE AVAILABLE IN THE ORTHOGRAPHIC VERSION. MOST ORTHOGRAPHIC IMAGES AVAILABLE WERE PRODUCED IN THE NGF VERSION AND, THEREFORE, DO NOT PRESENT TRUE ALBEDO CHARACTERISTICS. TO SELECT THESE DATA, USE THE SEDR (75-075A-01E); THE RECTILINEAR AND ORTHOGRAPHIC PHOTOGRAPHY INDEX (75-075A-01L); THE QUADRANT, LATITUDE, AND LONGITUDE INDEX (75-075A-01M); OR THE 10-DEG BOX INDEX (75-075A-01I). IN ORDERING, SPECIFY BOTH THE PICNO AND THE ROLL/FILE NUMBER.

****

DATA SET NAME- RECTILINEAR AND ORTHOGRAPHIC PHOTOGRAPHY INDEX ORDERED BY ROLL/FILE NUMBER

NSSDC ID- 75-075A-01L

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

QUANTITY OF DATA- 4 CARD(S) OF B/W MICROFICHE

ORIGINAL PAGE IS OF POOR QUALITY

ORIGINAL PAGE IS
OF POOR QUALITY

BRIEF DESCRIPTION
THIS DATA SET IS ON B/W MICROFICHE GENERATED AT NSSDC FROM HARDCOPY SUPPLIED BY THE ORBITER IMAGING TEAM. THE DATA ARE AN INDEX TO THE RECTILINEAR (75-075A-01B) AND ORTHOGRAPHIC (75-075A-01C) PHOTOGRAPHY, AND ARE SORTED BY ROLL/FILE NUMBER. THE INDEX LISTS THE PICTURE NUMBER (PICNO) AND THE VERSION (PROCLAB). THE INDEX IS PERIODICALLY UPDATED BY THE IMAGING TEAM.

****

DATA SET NAME- INDEX OF IMAGES ORDERED BY QUADRANT, LATITUDE, AND LONGITUDE ON MICROFILM

NSSDC ID- 75-075A-01M

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

QUANTITY OF DATA- 1 REEL(S) OF MICROFILM

BRIEF DESCRIPTION
THESE DATA, SUPPLIED BY THE ORBITER IMAGING TEAM, ARE AN INDEX OF RECTILINEAR, ORTHOGRAPHIC, AND MOSAIC IMAGES ORDERED BY QUADRANT, LATITUDE, AND LONGITUDE ON 16-MM MICROFILM. A QUADRANT IS ONE OF THE 30 SECTIONS INTO WHICH THE MARS SURFACE IS DIVIDED ON THE SET OF USGS 1:5,000,000 SCALE MAPS. THE INFORMATION LISTED INCLUDES PICNO, CENTER LATITUDE, CENTER LONGITUDE, INCIDENCE ANGLE, EMISSION ANGLE, FILTER, RANGE TO SURFACE, SCR-2 VERSION, NGF VERSION, ORTHOGRAPHIC PROJECTION VERSION, AND FOUR POSSIBLE MOSAIC APPEARANCES. THIS IS CONSIDERED THE BEST AND MOST COMPLETE INDEX FOR ORDERING ORBITER IMAGES FROM NSSDC.

****

DATA SET NAME- 10-DEG BOX INDEX AND LATITUDE AND LONGITUDE INDEX ON MICROFICHE

NSSDC ID- 75-075A-01I

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

QUANTITY OF DATA- 1 CARD(S) OF B/W MICROFICHE

BRIEF DESCRIPTION
THIS DATA SET, SUPPLIED BY THE ORBITER IMAGING TEAM, IS ON B/W MICROFICHE. IT CONSISTS OF TWO INDEXES: ONE LISTS THE IMAGES BY CENTER LATITUDE, AND THE OTHER LISTS THE IMAGES BY 10-DEG BOXES OF LATITUDE AND LONGITUDE. THE FIRST BOX IS AT 0 DEG LONGITUDE AND THE NORTH POLE, AND COVERS THE AREA 0 DEG TO 10 DEG W LONGITUDE AND 90 DEG TO 80 DEG N LATITUDE. THE SECOND BOX IS 10 DEG TO 20 DEG W LONGITUDE AND 90 DEG TO 80 DEG N LATITUDE. THE LATITUDE AND LONGITUDE OF THE INTERCEPT POINT 5 (CENTER OF IMAGE) ARE USED FOR THESE COMPUTATIONS, AND ONLY IMAGES WHERE THE INTERCEPT POINT 5 IS ON THE PLANET (EMAS LT 90 DEG) ARE LISTED. EACH INDEX CONTAINS THESE PARAMETERS: PICNO; FRAME START COUNT (FSC) NUMBER; CENTER LATITUDE; CENTER LONGITUDE; EMISSION ANGLE, THE ANGLE BETWEEN THE SURFACE NORMAL AND THE LINE TO THE SPACECRAFT; INCIDENCE ANGLE, THE ANGLE BETWEEN THE SURFACE NORMAL AND THE LINE TO THE SUN; RANGE TO SURFACE; AND MARS TIME.

****

DATA SET NAME- SEDR PHOTOGRAPHIC SUPPORT DATA ON MICROFICHE

NSSDC ID- 75-075A-01E

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 06/23/76 TO 09/20/76

QUANTITY OF DATA- 24 CARD(S) OF B/W MICROFICHE

BRIEF DESCRIPTION
THESE DATA ARE ON B/W MICROFICHE SUPPLIED BY THE ORBITER IMAGING TEAM. THIS DATA SET IS DERIVED FROM THE VIKING SUPPLEMENTARY EXPERIMENT DATA RECORD (SEDR). IT DEFINES THE GEOMETRICAL AND OTHER OBSERVATIONAL CONDITIONS THAT PERTAINED TO EVERY VIS FRAME ACQUIRED. PICTURES ARE LISTED IN CHRONOLOGICAL ORDER OF ACQUISITION, IDENTIFIED BY PICNO WITH SIX FRAMES ON A PAGE. SEVENTY-EIGHT PARAMETERS, WHICH INCLUDE THE FOLLOWING TYPES OF INFORMATION, ARE INCLUDED: TIME OF THE EVENT; CAMERA INFORMATION, INCLUDING IDENTIFICATION AND EXPOSURE; ORBITER POSITION AND CAMERA ORIENTATION; FRAME SIZE AND ORIENTATION ON THE SURFACE; LATITUDE, LONGITUDE, AND RANGE FOR THE CENTER AND CORNERS OF THE FRAME; VIEWING ANGLE, LIGHTING ANGLE, AND PHASE ANGLE OF THE CENTER AND CORNERS; AND ROLL AND FRAME NUMBERS FOR IDENTIFYING DIFFERENT PROCESSED VERSIONS OF EACH FRAME.

****

DATA SET NAME- PHOBOS, DEIMOS, STAR, TERMINATOR, AND LIMB IMAGES INDEX ON MICROFICHE

NSSDC ID- 75-075A-01K

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

QUANTITY OF DATA- 1 CARD(S) OF B/W MICROFICHE

BRIEF DESCRIPTION
THIS DATA SET IS AN INDEX OF IMAGES OF THE MARTIAN MOONS, STARS, MARS TERMINATOR, AND MARS LIMB ON B/W MICROFICHE GENERATED AT NSSDC FROM HARDCOPY SUPPLIED BY THE ORBITER IMAGING TEAM. IT LISTS PICNO; FILTER; EXPOSURE; THE RANGE FROM THE ORBITER TO PHOBOS, DEIMOS, AND THE LIMB OF MARS; AND THE SURFACE COORDINATES OF THE CORNER OR CENTER OF THE PICTURE, IF MARS APPEARS IN THE PICTURE. A 'TERMINATOR' PICTURE IS DEFINED AS A PICTURE FOR WHICH AT LEAST ONE CORNER IS ON THE UNLIGHTED PORTION OF THE MARS SURFACE. A 'LIMB' PICTURE HAS AT LEAST ONE CORNER OFF THE SURFACE ENTIRELY.

****

DATA SET NAME- B/W MOSAICS

NSSDC ID- 75-075A-01F

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 06/23/76 TO 12/08/77

QUANTITY OF DATA- 306 FRAMES

BRIEF DESCRIPTION
THESE DATA, SUPPLIED BY THE ORBITER IMAGING TEAM, ARE 4-X 5-IN. B/W MOSAICS. HAND-RENDERED MOSAICS ARE AVAILABLE FOR MUCH OF THE COVERAGE OBTAINED BY THE VIKING ORBITER CAMERAS. FOR THE MOST PART, THESE MOSAICS PROVIDE CONTIGUOUS COVERAGE OF SCENES MADE UP FROM INDIVIDUAL IMAGES, AND NO ATTEMPT HAS BEEN MADE TO CONFORM TO A GLOBAL CONTROL NET. MEASUREMENTS MADE FROM THESE MOSAICS WILL BE HIGHLY INACCURATE. MOSAICS PRODUCED BY THE UNITED STATES GEOLOGICAL SURVEY (USGS) DESIGNATED AS MC QUADS OR MC SUBQUADS AND BUILT UPON THE APPROPRIATE SHADED RELIEF MAP ARE VALID MAPPING COVERAGE. EACH MOSAIC, IDENTIFIED BY THE PREFIX 211- AND A FOUR-DIGIT NUMBER, IS SUPPLIED WITH A FOOTPRINT PLOT PROVIDING THE INDIVIDUAL PICNO AS WELL AS ROLL AND FILE ORDER NUMBERS FOR THE INDIVIDUAL FRAMES MAKING UP THE MOSAIC. ALL OF THESE NUMBERS SHOULD BE SPECIFIED WHEN ORDERING INDIVIDUAL FRAMES. IN A FEW CASES WHERE THE PARTICULAR VERSION OF A FRAME IN THE MOSAIC IS NOT AVAILABLE, A SIMILAR VERSION OF THAT FRAME IS DESIGNATED ON THE FOOTPRINT PLOT. THE MOSAIC SUMMARY AND INDEX (75-075A-01J) SHOULD BE USED TO SELECT DATA.

****

DATA SET NAME- MOSAIC SUMMARY AND INDEX ON MICROFICHE

NSSDC ID- 75-075A-01J

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

QUANTITY OF DATA- 2 CARD(S) OF B/W MICROFICHE

BRIEF DESCRIPTION
THIS DATA SET, SUPPLIED BY THE ORBITER IMAGING TEAM, CONSISTS OF A SUMMARY AND INDEX OF VIKING ORBITER MOSAICS ON B/W MICROFICHE. THE SUMMARY CONTAINS IDENTIFICATION NUMBER, MOSAIC ID, COMMENTS (AREA OR FEATURES IN VIEW), PRODUCTION TIME, REVOLUTION NUMBER, NUMBER OF IMAGES MOSAICKED, MINIMUM AND MAXIMUM LATITUDE, AND MINIMUM AND MAXIMUM LONGITUDE. THIS SUMMARY IS FOLLOWED BY AN INDEX ORDERED BY PICNO NUMBER THAT CROSS-REFERENCES THE PAGE NUMBER OF THE MOSAIC IN THE SUMMARY SECTION. THE INDEX INCLUDES, PICNO, CENTRAL LATITUDE, AND CENTRAL LONGITUDE OF EACH PHOTO IN THE MOSAIC.

****

DATA SET NAME- B/W STEREO PAIRS

NSSDC ID- 75-075A-01H

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 06/23/76 TO 04/22/77

QUANTITY OF DATA- 28 FRAMES

BRIEF DESCRIPTION
THESE DATA, SUPPLIED BY THE ORBITER IMAGING TEAM, ARE ON 5- X 5-IN. B/W FILM AND CONSIST OF FRAMES IDENTIFIED AS HAVING OVERLAPPING COVERAGE. STEREO STUDIES OF VIKING IMAGES ARE STILL IN THE EARLIEST STAGES AND NO STEREO PRODUCT AS SUCH HAS BEEN DEFINED. FRAMES SHOULD BE ORDERED IN THE ORTHOGRAPHIC VERSION FOR STEREO STUDIES. IT SHOULD BE UNDERSTOOD THAT THE VISUAL IMAGING SUBSYSTEM ON THE VIKING ORBITERS WAS NOT WELL ADAPTED FOR ACQUIRING STEREO DATA, AND THAT THEIR ACQUISITION WAS NOT A MAJOR OBJECTIVE OF THE PRIMARY MISSION. THE PAIRS CONTAIN SIGNIFICANT BUT VARIABLE AMOUNTS OF OVERLAP. IN SOME CASES THE TWO FRAMES WERE TAKEN AT WIDELY DIFFERENT TIMES SO THAT LIGHTING CONDITIONS DID NOT MATCH WELL. STEREO COVERAGE OF HIGHER QUALITY AND GREATER QUANTITY WAS OBTAINED IN THE EXTENDED MISSION AND WILL BE AVAILABLE AT A LATER TIME.

****

INVESTIGATION NAME- INFRARED THERMAL MAPPING (IRTM)

NSSDC ID- 75-075A-02

PERSONNEL

TL - H.H.	K'EFFER	U OF CALIF, LA
TM - G.	MUNCH	CALIF INST OF TECH
TM - E.D.	MINER	NASA-JPL
TM - G.	NEUGEBAUER	CALIF INST OF TECH
TM - S.C.	CHASE, JR.	SANTA BARBARA RES CTR

BRIEF DESCRIPTION

THE PURPOSE OF THE IRTM EXPERIMENT WAS TO MEASURE THE TEMPERATURES OF THE ATMOSPHERE AND AREAS ON THE SURFACE OF MARS. THE AMOUNT OF SUNLIGHT REFLECTED BY THE PLANET WAS ALSO MEASURED. THE IRTM WAS A MULTICHANNEL RADIOMETER MOUNTED ON THE ORBITER'S SCAN PLATFORM. FOUR SMALL TELESCOPES, EACH WITH SEVEN INFRARED DETECTORS, WERE AIMED PARALLEL TO THE VISUAL IMAGING OPTICAL AXIS, AND MADE OBSERVATIONS EVERY 1.12 S. THE INSTRUMENT WAS CAPABLE OF MEASURING DIFFERENCES OF 1 C THROUGHOUT A TEMPERATURE RANGE OF -130 C TO +57 C. THE FIELD OF VIEW WAS CIRCULAR, 5 MILLIRADIANS IN DIAMETER.

****

DATA SET NAME- DECALIBRATED INFRARED THERMAL MAPPING DATA ON MAGNETIC TAPE

NSSDC ID- 75-075A-02A

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 07/22/76 TO 09/09/76

QUANTITY OF DATA- 13 REEL(S) OF MAGNETIC TAPE

BRIEF DESCRIPTION

THESE DATA ARE CONTAINED ON 9-TRACK, BINARY, 800-BPI MAGNETIC TAPE SUPPLIED BY THE INVESTIGATION TEAM. THEY CONTAIN THE DECALIBRATED VALUES OF BRIGHTNESS FOR EVERY OBSERVATION AND A VARIETY OF GEOMETRICAL PARAMETERS TO DEFINE THE AREA VIEWED AND THE PERTINENT OBSERVATIONAL PARAMETERS. INCLUDED ARE HEADER RECORDS SPECIFYING THE GEOMETRY OF THE ORBIT AND OF THE SPACECRAFT AT THE TIME OF THE OBSERVATIONAL SEQUENCE, AND DATA RECORDS GIVING THE BRIGHTNESS DATA AND THE GEOMETRIC PARAMETERS PERTAINING TO EACH MEASUREMENT.

****

INVESTIGATION NAME- MARS ATMOSPHERIC WATER DETECTION (MAWD)

NSSDC ID- 75-075A-03

PERSONNEL

TL - C.B.	FARMER	NASA-JPL
TM - D.D.	LAPORTE	SANTA BARBARA RES CTR
TM - D.W.	DAVIES	NASA-JPL

BRIEF DESCRIPTION

THE MAWD USED AN INFRARED GRATING SPECTROMETER MOUNTED ON THE ORBITER SCAN PLATFORM THAT WAS BORESIGHTED WITH THE TELEVISION CAMERAS AND THE IRTM. THE INSTRUMENT MEASURED SOLAR INFRARED RADIATION REFLECTED FROM THE SURFACE THROUGH THE ATMOSPHERE TO THE SPACECRAFT. SPECTRAL INTERVALS WERE SELECTED COINCIDENT WITH THE WAVELENGTH OF WATER VAPOR ABSORPTION LINES IN THE 1.4-MICROMETER BAND. THE QUANTITY OF WATER VAPOR ALONG THE LINE OF SIGHT WAS MEASURED FROM 1 TO 100 MICROMETERS OF PRECIPITABLE WATER WITH AN ACCURACY OF 5 PERCENT OR BETTER. THE INSTANTANEOUS FIELD OF VIEW OF THE INSTRUMENT WAS 2 X 17 MILLIRADIANS, AND A STEPPING MIRROR ROTATED THE LINE OF SIGHT THROUGH 15 POSITIONS TO PROVIDE A ROUGHLY RECTANGULAR FIELD OF VIEW OF 17 X 31 MILLIRADIANS.

****

DATA SET NAME- MAWD RADIANCE AND GEOMETRY DATA ON TAPE

NSSDC ID- 75-075A-03A

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 06/18/76 TO 04/27/77

QUANTITY OF DATA- 21 REEL(S) OF MAGNETIC TAPE

BRIEF DESCRIPTION

THESE DATA ARE CONTAINED ON 9-TRACK, BINARY, 800-BPI MAGNETIC TAPE SUPPLIED BY THE INVESTIGATION TEAM. THEY CONTAIN THE DECALIBRATED VALUES OF THE INFRARED RADIANCE FROM EACH OBSERVATION AND A VARIETY OF GEOMETRICAL PARAMETERS THAT DEFINE THE AREA VIEWED, AND INCLUDE PERTINENT OBSERVATIONAL PARAMETERS. EACH TAPE RECORD CONTAINS ALL THE DATA FROM ONE COMPLETE RASTER (15 CONSECUTIVE MEASUREMENTS), INCLUDING THE RADIANCES AND THE AREA OF THE SURFACE VIEWED, FOLLOWED BY AVERAGE VALUES FOR THE WHOLE RASTER AS WELL AS PERTINENT GEOMETRICAL AND TIMING INFORMATION.

****

INVESTIGATION NAME- ORBITER RADIO SCIENCE

NSSDC ID- 75-075A-04

PERSONNEL

TL - W.H.	MICHAEL, JR.	NASA-LARC
TM - I.I.	SHAPIRO	MASS INST OF TECH
TM - G.	FJELDBO	NASA-JPL
TM - J.G.	DAVIES	U OF MANCHESTER
TM - D.L.	CAIN	NASA-JPL
TM - M.D.	GROSSI	RAYTHEON CORP
TM - G.L.	TYLER	STANFORD U
TM - J.P.	BRENKLE	NASA-JPL
TM - R.H.	TOLSON	NASA-LARC
TM - C.T.	STELZRIED	NASA-JPL
TM - G.	BORN	NASA-JPL
TM - R.	REASENBERG	MASS INST OF TECH

BRIEF DESCRIPTION

THERE ARE FOUR DISTINCT SETS OF VIKING RADIO SCIENCE DATA -- THREE USING ORBITER DATA AND ONE PRIMARILY USING LANDER DATA WITH CALIBRATIONS FROM ORBITER DATA. THE ORBITER TRACKING DATA, OBTAINED FROM THE TWO-WAY ORBITER-EARTH S-BAND AND X-BAND RADIO LINKS, CONSIST OF DOPPLER FREQUENCIES AND TIME-OF-FLIGHT RANGE MEASUREMENTS. THESE DETERMINED THE POSITION AND MOTION OF THE ORBITERS, AND CAN BE USED TO STUDY THE MARS GRAVITATIONAL FIELD, THE PLASMA IN INTERPLANETARY SPACE, AND THE STRUCTURE OF THE SOLAR CORONA. THE OCCULTATION DATA WERE OBTAINED FROM THESE SAME RADIO LINKS BY ANALOG RECORDING OF THE SIGNAL WHEN A SPACECRAFT WAS PASSING INTO OR OUT OF OCCULTATION WITH MARS. THE DATA CAN BE USED TO PRODUCE ALTITUDE PROFILES OF THE TEMPERATURE, DENSITY, AND PRESSURE OF THE ATMOSPHERE (INCLUDING THE IONOSPHERE) AND TO MEASURE THE RADIUS OF THE PLANET USING A LARGE NUMBER OF SURFACE POINTS. THE SURFACE PROPERTIES ASPECT OF THIS INVESTIGATION UTILIZED THE UHF (381 MHZ) SIGNAL ON WHICH THE LANDERS TRANSMITTED DATA TO THE ORBITERS. AT THE BEGINNING OR END OF A DATA TRANSMISSION SESSION, WHEN THE ORBITER WAS NEAR THE LANDER'S HORIZON, THE STRENGTH OF THE RECEIVED SIGNAL WAS RECORDED, AS A FUNCTION OF TIME. THESE SIGNAL "FADING PATTERNS," RESULTING FROM INTERACTION OF THE RADIO WAVES WITH THE MARTIAN SURFACE, CONTAIN INFORMATION ABOUT THE PHYSICAL PROPERTIES OF THE SURFACE NEAR THE LANDERS. THE LANDER TRACKING DATA FROM THE TWO-WAY DIRECT LANDER-EARTH S-BAND LINKS PERMIT DETERMINATION OF THE LOCATION OF THE LANDERS AND STUDIES OF THE MOTION OF THE PLANET.

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DATA SET NAME- SURFACE ELECTRICAL PROPERTY DATA PLOTS ON MICROFILM

NSSDC ID- 75-075A-04A

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 07/21/76 TO 10/04/76

QUANTITY OF DATA- 1 REEL(S) OF MICROFILM

BRIEF DESCRIPTION

THESE DATA ARE ON 16-MM MICROFILM GENERATED BY NSSDC FROM PAPER PLOTS SUPPLIED BY THE RADIO SCIENCE TEAM. THE PLOTS SHOW AMPLITUDE VS TIME OF LANDER TELEMETRY SIGNALS RECEIVED BY THE ORBITERS. THIS DATA SET INCLUDES ORBITER 2 AND LANDER 1 AND 2 DATA. THERE ARE THREE SECTIONS TO THE DATA: MULTIPATH RESIDUAL DATA FROM LANDER 1 TO ORBITER 1, GAIN AND AXIAL RATIO DATA FROM LANDER 2 TO ORBITER 2, AND GAIN AND AXIAL RATIO DATA FROM LANDER 2 TO ORBITER 1.

****

DATA SET NAME- RADIO OCCULTATION OBSERVATIONS ON MAGNETIC TAPE

NSSDC ID- 75-075A-04B

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 10/06/76 TO 11/01/76

QUANTITY OF DATA- 7 REEL(S) OF MAGNETIC TAPE

BRIEF DESCRIPTION

THESE DATA, SUPPLIED BY THE RADIO SCIENCE TEAM, ARE CONTAINED ON 7-TRACK, 800-BPI, BCD MAGNETIC TAPES. IN ONE OCCULTATION OBSERVATION SEVERAL HUNDRED TO SEVERAL THOUSAND MEASUREMENTS OF DOPPLER FREQUENCY WERE MADE USING EITHER THE S-BAND OR X-BAND FREQUENCIES, OR BOTH. FOR EACH MEASUREMENT THERE IS TRAJECTORY INFORMATION AND FREQUENCY INFORMATION. ON THE TAPES, TRAJECTORY FILES GIVING THE POSITION AND VELOCITY OF THE ORBITER AND EARTH RELATIVE TO MARS ALTERNATE WITH DATA FILES GIVING THE MEASURED DOPPLER FREQUENCY OR FREQUENCIES AT CORRESPONDING TIMES.

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DATA SET NAME- ORBITER RADIO SCIENCE TRACKING DATA ON MAGNETIC TAPE

NSSDC ID- 75-075A-04D

AVAILABILITY OF DATA SET- DATA IDENTIFIED BUT NOT RECEIVED

BRIEF DESCRIPTION
THESE 7-TRACK, 800-BPI MAGNETIC TAPES, SUPPLIED BY THE RADIO SCIENCE TEAM, ARE MERGED AND REFORMATTED VERSIONS OF THE ORIGINAL PROJECT TRACKING TAPES. EACH RECORD CONTAINS ALL OR A SUBSET OF THE FOLLOWING PARAMETERS: TIME, S-BAND DOPPLER FREQUENCY, X-BAND DOPPLER FREQUENCY, S-BAND RANGE AND X-BAND RANGE (LIGHT TIME IN NANOSECONDS), AND CERTAIN TRACKING STATION INFORMATION. SPACING BETWEEN DOPPLER POINTS IS 1 MIN OR LESS AND BETWEEN RANGING POINTS IS FROM 5 TO 20 MIN. FOR ANALYSIS OF THE DOPPLER AND RANGE TRACKING DATA FROM THE ORBITERS, TWO TYPES OF ADDITIONAL DATA ARE REQUIRED: (1) ORBITER STATE VECTORS -- THESE ARE TABULATIONS (USUALLY DAILY) OF THE POSITION AND VELOCITY VECTORS OF THE SPACECRAFT IN VARIOUS COORDINATE SYSTEMS, AND (2) CALENDAR OF ORBITER MANEUVERS -- THESE ARE CHRONOLOGICAL LISTINGS OF THE TIMES OF ORBITER MANEUVERS. PROPULSIVE MANEUVERS CHANGED THE SPACECRAFT ORBIT DISCONTINUOUSLY. NONPROPULSIVE MANEUVERS, WHICH MERELY REORIENTED THE ORBITER, ARE NEVERTHELESS CLEARLY VISIBLE IN THE DOPPLER DATA. THESE TWO ADDITIONAL TYPES OF SUPPORTING DATA ARE INCLUDED AS PART OF THIS DATA SET.

****

DATA SET NAME- DECALIBRATED RANGE DATA ON MAGNETIC TAPE

NSSDC ID- 75-075A-04E

AVAILABILITY OF DATA SET- DATA IDENTIFIED BUT NOT RECEIVED

BRIEF DESCRIPTION
THESE DATA, SUPPLIED BY THE RADIO SCIENCE TEAM, ARE ON 7-TRACK, 800-BPI MAGNETIC TAPES. FOR THE 'GOOD' RANGE POINTS, WHICH ARE A SUBSET OF THE RANGE POINTS ON THE TRACKING DATA TAPES (SEE 75-075A-04D), THE RESULTS OF AN EXTENSIVE CALIBRATION PROGRAM ARE PRESENTED. THE PARAMETERS LISTED ARE TIME, UNCORRECTED RANGE IN NANOSECONDS, CORRECTION FOR TIME DELAY IN THE SPACECRAFT TRANSPONDER, CORRECTION FOR TIME DELAY IN THE TRACKING STATION EQUIPMENT, CORRECTION FOR THE INTERPLANETARY PLASMA EFFECT (FROM COMPARISON OF S- AND X-BAND DATA), AND FINAL CORRECTED RANGE. THE LATTER SHOULD BE THE BEST OBTAINABLE VALUE OF THE RANGE BETWEEN THE TRACKING STATION ANTENNA AND THE SPACECRAFT ANTENNA.

****

SPACECRAFT COMMON NAME- VIKING 1 LANDER

NSSDC ID- 75-075C

LAUNCH DATE- 08/20/75

PERSONNEL

MG - W.	JAKOBOWSKI	NASA HEADQUARTERS
SC - R.S.	YOUNG	NASA HEADQUARTERS
PM - K.S.	WATKINS	NASA-JPL
PS - C.W.	SNYDER	NASA-JPL

BRIEF DESCRIPTION
THIS SPACECRAFT WAS THE LANDING VEHICLE FOR THE TWO-PART SPACECRAFT MISSION. IT SOFT-LANDED ON JULY 20, 1976, IN THE CHRYSE REGION OF MARS AT 22.27 DEG N LATITUDE AND 47.94 DEG W LONGITUDE. THE LANDER CARRIED INSTRUMENTS TO STUDY THE BIOLOGY, CHEMICAL COMPOSITION (ORGANIC AND INORGANIC), METEOROLOGY, SEISMOLOGY, MAGNETIC PROPERTIES, SURFACE APPEARANCE, AND PHYSICAL PROPERTIES OF THE MARTIAN SURFACE AND ATMOSPHERE. THE LANDER HAD A 70-W POWER CAPACITY AND A SCIENTIFIC PAYLOAD OF APPROXIMATELY 91 KG (200 LB). SOME OF THE DATA COLLECTED WERE RETURNED BY DIRECT RADIO LINK TO EARTH, BUT MOST OF THE DATA WERE RETURNED BY RELAY THROUGH ONE OF THE ORBITERS.

****

INVESTIGATION NAME- PHYSICAL PROPERTIES

NSSDC ID- 75-075C-01

PERSONNEL

TL - R.W.	SHORTHILL	U OF UTAH
TM - R.E.	HUTTON	TRW SYSTEMS GROUP
TM - H.J.	MOORE, II	US GEOLOGICAL SURVEY
TM - R.F.	SCOTT	CALIF INST OF TECH

BRIEF DESCRIPTION
THE PURPOSE OF THE PHYSICAL PROPERTIES INVESTIGATION WAS TO DETERMINE THE PHYSICAL PROPERTIES OF THE MARTIAN SURFACE AND ENVIRONMENT AT THE LANDING SITE, PRIMARILY USING ENGINEERING MEASUREMENTS AND SCIENTIFIC INSTRUMENTS REQUIRED TO MEET OTHER MISSION OBJECTIVES. IN PARTICULAR, IT ATTEMPTED TO DETERMINE SUCH PROPERTIES AS BULK DENSITY, BEARING STRENGTH, ANGLE OF REPOSE, COHESION, ANGLE OF INTERNAL FRICTION, PARTICLE CHARACTERISTICS, THERMAL PARAMETERS, EOLIAN TRANSPORTABILITY, TOPOGRAPHY, AND CERTAIN ENVIRONMENTAL PROPERTIES SUCH AS WIND, TEMPERATURE, AND SOLAR FLUX LEVELS. MAXIMUM USE WAS MADE OF HARDWARE AND INSTRUMENTS INTENDED FOR OTHER APPLICATIONS, SUCH AS THE MECHANICAL SUBSYSTEMS AND LANDER CAMERAS. ONLY PASSIVE DEVICES, SUCH AS MIRRORS AND LANDING LEG STROKE GAUGES, WERE ADDED FOR THIS EXPERIMENT.

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DATA SET NAME- PUBLISHED REPORTS ON THE RESULTS OF THE PHYSICAL PROPERTIES EXPERIMENT

NSSDC ID- 75-075C-01A

AVAILABILITY OF DATA SET- DATA IN PUBLISHED REPORT(S)

QUANTITY OF DATA- 12 PAGE(S) OF UNBOUND HARDCOPY

BRIEF DESCRIPTION
THIS DATA SET CONSISTS OF REPORTS PUBLISHED BY THE INVESTIGATION TEAM THAT DISCUSS THE RESULTS OF THE PHYSICAL PROPERTIES EXPERIMENT. THE REPORTS DISCUSS THE HARDWARE USED, THE RESULTS OF TESTS USING THE SYSTEMS TEST BED, THE RESULTS OF THE IMAGING SCIENCE TESTS, AND THE RESULTS OF THE SCIENCE END-TO-END TESTS. THE APPROXIMATE DATES OF THE TESTS AND THE ELEMENTS TESTED ARE ALSO DISCUSSED. IT IS EMPHASIZED THAT THE RESULTS ARE PRELIMINARY AND, THEREFORE, SUBJECT TO CHANGE.

****

INVESTIGATION NAME- ENTRY SCIENCE ATMOSPHERIC STRUCTURE

NSSDC ID- 75-075C-02

PERSONNEL

TL - A.O.C.NIER		U OF MINNESOTA
TM - A.	SEIFF	NASA-ARC
TM - N.W.	SPENCER	NASA-GSFC

BRIEF DESCRIPTION
THE ENTRY SCIENCE ATMOSPHERIC STRUCTURE EXPERIMENT (ONE OF THREE THAT WERE PART OF THE ENTRY SCIENCE INVESTIGATION) STUDIED THE MARTIAN ATMOSPHERE BELOW AN ALTITUDE OF 132 KM. A VARIETY OF INSTRUMENTS (ACCELEROMETERS, RADAR ALTIMETERS, THERMOMETERS, PRESSURE SENSORS) COLLECTED DATA TO PROVIDE ALTITUDE PROFILES OF PRESSURE AND TEMPERATURE OF THE ATMOSPHERE AND ACCELERATION OF THE LANDER CAPSULE. FROM THESE DATA, ATMOSPHERIC DENSITY AND MEAN ATOMIC MASS CAN BE CALCULATED.

****

DATA SET NAME- TABULATIONS OF ENTRY MEASUREMENTS FOR ATMOSPHERIC STRUCTURE ON MICROFICHE

NSSDC ID- 75-075C-02A

AVAILABILITY OF DATA SET- DATA IDENTIFIED BUT NOT RECEIVED

BRIEF DESCRIPTION
THIS DATA SET, SUPPLIED BY THE INVESTIGATION TEAM, IS ON B/W MICROFICHE, AND CONTAINS TABULATIONS OF VARIOUS PARAMETERS AS FUNCTIONS OF TIME, COVERING TWO PHASES OF THE DESCENTS: (1) FROM 132 KM TO 6 KM IN ALTITUDE WITH THE LANDERS IN THEIR AEROSHELLS AND (2) FROM 6 KM TO 1.5 KM ON PARACHUTES. THE PARAMETERS LISTED FOR BOTH LANDERS ARE ACCELERATION ALONG TWO AXES, ALTITUDE MEASURED BY THE ALTIMETER, VELOCITY (MAGNITUDE AND PATH ANGLE), PRESSURE, AND TEMPERATURE.

****

INVESTIGATION NAME- BIOLOGY

NSSDC ID- 75-075C-03

ORIGINAL PAGE IS
OF POOR QUALITY

PERSONNEL

TL - H.P.	KLEIN	NASA-ARC
TM - J.	LEDERBERG	STANFORD U
TM - A.	RICH	MASS INST OF TECH
TM - N.H.	HOROWITZ	CALIF INST OF TECH
TM - V.I.	OYAMA	NASA-ARC
TM - G.V.	LEVIN	BIOSPHERICS, INC

BRIEF DESCRIPTION
THE BIOLOGY EXPERIMENT SEARCHED FOR THE PRESENCE OF MARTIAN ORGANISMS BY LOOKING FOR METABOLIC PRODUCTS. THREE DISTINCT INSTRUMENTS (PYROLYTIC RELEASE (PR), LABELED RELEASE (LR), AND GAS EXCHANGE (GEX)) INCUBATED SAMPLES OF THE MARTIAN SURFACE UNDER A NUMBER OF DIFFERENT ENVIRONMENTAL CONDITIONS. IN SOME INSTANCES A SAMPLE WAS HEAT STERILIZED AND REPROCESSED AS A CONTROL. THE PR, OR CARBON ASSIMILATION, INSTRUMENT SOUGHT TO DETECT THE PHOTOSYNTHETIC OR CHEMICAL FIXATION OF CO_2 OR CO CONTAINING C-14. THE SAMPLES WERE INCUBATED FOR SEVERAL DAYS IN THE PRESENCE OF THE RADIOACTIVE GAS MIXTURE, SOME SAMPLES WITH SIMULATED SUNLIGHT AND SOME WITHOUT. NEXT, EACH SAMPLE WAS HEATED TO 120 C TO REMOVE UNREACTED CO_2 AND CO. THE SOIL WAS PYROLIZED AT 650 C AND ANY ORGANIC PRODUCTS WERE COLLECTED IN AN ORGANIC VAPOR TRAP (OVT). FINALLY, THE TRAP WAS HEATED TO COMBUST THE ORGANIC MATERIAL TO CO_2 AND ANY EVOLVED RADIOACTIVE GAS WAS MEASURED. THE LR EXPERIMENT SOUGHT TO DETECT METABOLIC PROCESSES THROUGH RADIORESPIROMETRY. LIQUID NUTRIENTS LABELED WITH RADIOACTIVE CARBON WERE ADDED TO THE SAMPLES AND THE ATMOSPHERE ABOVE WAS CONTINUOUSLY MONITORED

TO DETECT ANY RADIOACTIVE GASES RELEASED FROM THESE NONVOLATILE NUTRIENTS. THE GEX MEASURED THE PRODUCTION AND/OR UPTAKE OF CO2, N2, CH4, H2, AND O2 DURING INCUBATION OF A SOIL SAMPLE. THE SAMPLE WAS SEALED AND PURGED BY HE; THEN A MIXTURE OF HE, KR, AND CO2 WAS INTRODUCED AS AN INITIAL INCUBATION ATMOSPHERE. AFTER THE ADDITION OF A SELECTED QUANTITY OF A NUTRIENT SOLUTION (SATURATED WITH THE DIAGNOSTIC GAS, NEON), THE SAMPLE WAS INCUBATED. AT CERTAIN INTERVALS, SAMPLES OF THE ATMOSPHERE WERE REMOVED AND ANALYZED BY A GAS CHROMATOGRAPH WITH A THERMAL CONDUCTIVITY DETECTOR.

****

DATA SET NAME- GAS EXCHANGE, LABELED RELEASE, AND PYROLYTIC RELEASE DATA ON MICROFILM

NSSDC ID- 75-075C-03F

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 07/20/76 TO 05/30/77

QUANTITY OF DATA- 13 REEL(S) OF MICROFILM

BRIEF DESCRIPTION
THESE DATA, SUPPLIED BY THE INVESTIGATION TEAM, ARE ON 16-MM MICROFILM AND CONSIST OF DESCRIPTIONS OF THE COMMANDS THAT WERE SENT TO OPERATE THE THREE INSTRUMENTS AND TABULATIONS OF RAW AND REDUCED DATA RETURNED. THE COMMAND DATA INCLUDE MARS TIME FOR EACH EXPERIMENT SEQUENCE, THE COMMANDS SENT, PREDICTED DATA POINTS FOR EACH COMMAND FILE THAT WERE USED TO TIME TAG THE DATA WHEN IT CAME BACK FROM THE INSTRUMENT, AND A SUMMARY OF THE MAJOR EVENTS OF EACH COMMAND SEQUENCE. THESE COMMAND DATA ARE IDENTIFIED AS BIOLOGY/C. THE TABULATION/PLOT DATA INCLUDE INSTRUMENT RESPONSE, TIME-TAGGED, ENGINEERING, AND SUMMARY PLOT DATA. THE INSTRUMENT RESPONSE DATA CONSIST OF RAW RETURN DOWNLINK DATA IN OCTAL FORM, THE SAME DATA AFTER BASIC REDUCTION, AND THE TIME-TAGGED DATA IN VALUE POINT FORM. THE TIME-TAGGED DATA ARE THE PRIMARY REDUCED FORM OF THE DATA. THESE DATA ARE MARS MISSION TIME (MMT) OF THE DATA POINT, LOCAL LANDER TIME (LLT), TYPE OF MEASUREMENT, THE VALUE OF THE DATA POINT, AND DIAGNOSTIC INFORMATION ABOUT EACH DATA POINT. ENGINEERING DATA ARE INCLUDED AFTER THE RAW AND REDUCED DATA. THE FOURTH PART OF THE DATA IS PLOTS THAT SUMMARIZE THE DATA. THE REDUCED DATA FOR THE BIOLOGY INSTRUMENT ARE GEX CHROMATOGRAM VOLTAGES, GEX NANOMOLES VS TIME PLOTS, PR RADIOACTIVITY VS TIME, LR COUNTS/MIN SUMMARY, AND TIME-TAGGED INSTRUMENT VALUES.

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INVESTIGATION NAME- MOLECULAR ANALYSIS

NSSDC ID- 75-075C-04

PERSONNEL

TL - K.	BIEMANN	MASS INST OF TECH
TM - H.C.	UREY	U OF CALIF, SAN DIEGO
TM - D.M.	ANDERSON	USA-CRREL
TM - T.	OWEN	STATE U OF NEW YORK
TM - J.	ORO	U OF HOUSTON
TM - L.E.	ORGEL	SALK INST BIOL STUDIES
TM - A.O.C.	NIER	U OF MINNESOTA
TM - P.	TOULMIN, 3RD	US GEOLOGICAL SURVEY

BRIEF DESCRIPTION
THE MOLECULAR ANALYSIS EXPERIMENT SEARCHED FOR CHEMICAL COMPOUNDS IN THE UPPER SURFACE LAYER OF MARS AND MEASURED ATMOSPHERIC COMPOSITION NEAR THE SURFACE. THE SOIL ANALYSES WERE PERFORMED USING A GAS CHROMATOGRAPH MASS SPECTROMETER (GCMS) THAT HAD HIGH SENSITIVITY, HIGH STRUCTURAL SPECIFICITY, AND BROAD APPLICABILITY TO A WIDE RANGE OF COMPOUNDS. SUBSTANCES WERE VAPORIZED FROM THE SURFACE MATERIAL BY A HEATING PROCESS WHILE CO2 (LABELED WITH C-13) SWEPT THROUGH. THE MATERIAL WAS THEN CARRIED INTO A TENEX GAS-CHROMATOGRAPHIC COLUMN THAT WAS SWEPT WITH HYDROGEN AS A CARRIER GAS. WHILE PASSING THROUGH THE COLUMN, SUBSTANCES WERE SEPARATED BY DIFFERENT DEGREES OF RETENTION. THE RESIDUAL STREAM MOVED INTO THE MASS SPECTROMETER (AFTER HYDROGEN WAS REMOVED BY HYDROGEN-ONLY-PERMEABLE PALLADIUM, AND A MASS SPECTRUM (MASSES FROM 12 TO 200 U) WAS OBTAINED EVERY 10 S FOR THE 84 MIN OF THE GAS CHROMATOGRAM. IN SOME CASES, THE SAME SAMPLE WAS REHEATED AT A HIGHER TEMPERATURE AND ANALYZED TO DETECT LESS VOLATILE MATERIALS. FOR ATMOSPHERIC MEASUREMENTS, GASES WERE DIRECTLY INTRODUCED INTO THE MASS SPECTROMETER, BYPASSING THE GAS CHROMATOGRAPH COLUMN.

****

DATA SET NAME- GAS CHROMATOGRAPH MASS SPECTROMETER SOIL ANALYSIS DATA ON MAGNETIC TAPE

NSSDC ID- 75-075C-04A

AVAILABILITY OF DATA SET- DATA IDENTIFIED BUT NOT RECEIVED

BRIEF DESCRIPTION
THESE DATA, ON 9-TRACK, 800-BPI, UNLABELED, IBM-COMPATIBLE TAPES, ARE IN RAW FORM, JUST AS THEY WERE RECEIVED BY THE VIKING EXPERIMENTERS FROM THE TELEMETRY DECOMMUTATION PROGRAM OUTPUT, EXCEPT THAT THEY HAVE BEEN PUT INTO LOGICAL ORDER AND GAPS HAVE BEEN FILLED IN. THEY ARE UNLIKELY TO BE USABLE BY ANYONE NOT VERY FAMILIAR WITH THE MISSION OPERATIONS AND THE INSTRUMENT DESIGN. EACH SAMPLE RUN, COMPRISING ONE FILE ON THE TAPE, INCLUDES SEVERAL SPECTRAL SCANS DIVIDED ARBITRARILY INTO SMALL BLOCKS. THE QUANTITIES LISTED ARE THE OUTPUT OF THE ANALOG-TO-DIGITAL CONVERTER ON A LOGARITHMIC SCALE AS A FUNCTION OF TIME. SEPARATE BLOCKS OF ENGINEERING DATA CONTAIN TEMPERATURES, PRESSURES, AND OTHER INSTRUMENT PARAMETERS.

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DATA SET NAME- SOIL ANALYSIS MASS SPECTRA ON MAGNETIC TAPE

NSSDC ID- 75-075C-04B

AVAILABILITY OF DATA SET- DATA IDENTIFIED BUT NOT RECEIVED

BRIEF DESCRIPTION
THE MASS SPECTRUM DATA, ON 9-TRACK, 800-BPI TAPES, ARE REDUCED VERSIONS OF THE GCMS SOIL ANALYSIS DATA (75-075C-04A). EACH SAMPLE RUN IS ON A SEPARATE FILE, AND THERE IS ONE RECORD FOR EACH SPECTRAL SCAN, INCLUDING MASS SPECTRUM DATA AND ENGINEERING DATA. LISTED IS THE INTENSITY IN ARBITRARY LINEAR UNITS AS A FUNCTION OF MASS NUMBER FROM 12 TO 215 IN THE CONVENTIONAL MASS SPECTRUM FORMAT. THE ENGINEERING INFORMATION INCLUDED PERMITS CONVERSION OF INTENSITIES TO CURRENT UNITS.

****

DATA SET NAME- SOIL ANALYSIS MASS SPECTRA ON MICROFILM

NSSDC ID- 75-075C-04C

AVAILABILITY OF DATA SET- DATA IDENTIFIED BUT NOT RECEIVED

BRIEF DESCRIPTION
THE SAME DATA AS ON THE MASS SPECTRA TAPES ARE PRESENTED AS BAR GRAPHS ON 16-MM MICROFILM. EACH FRAME CONTAINS ONE COMPLETE GRAPH OF THE INTENSITIES OF ALL MASSES DETECTED. BECAUSE THE LOWER MASSES (MOSTLY CO2 AND H2O) ARE PREDOMINANT, A SECOND GRAPH STARTING AT ABOUT MASS 45 SHOWS THE HEAVY ELEMENTS AT A MORE APPROPRIATE SCALE. GRAPHS OF ENGINEERING PARAMETERS ARE ALSO INCLUDED.

****

DATA SET NAME- GCMS ATMOSPHERIC ANALYSIS DATA ON MAGNETIC TAPE

NSSDC ID- 75-075C-04D

AVAILABILITY OF DATA SET- DATA IDENTIFIED BUT NOT RECEIVED

BRIEF DESCRIPTION
THESE DATA, ON 9-TRACK, 800-BPI TAPE, ARE THE GCMS RAW DATA FOR THE ATMOSPHERIC ANALYSES. FOR THE VIKING 1 PRIMARY MISSION THERE WERE 4 FILTERED ATMOSPHERIC SAMPLES WITH CO AND CO2 REMOVED, 17 UNFILTERED SAMPLES, AND 3 SAMPLES AFTER 10 ENRICHMENT CYCLES TO INCREASE THE CONCENTRATION OF TRACE ELEMENTS. FOR THE VIKING 2 PRIMARY MISSION THERE WERE 4 FILTERED ATMOSPHERIC SAMPLES WITH CO AND CO2 REMOVED, 2 UNFILTERED SAMPLES, 1 SAMPLE AFTER 5 ENRICHMENT CYCLES, 2 SAMPLES AFTER 10 ENRICHMENT CYCLES, AND 6 SAMPLES AFTER 15 ENRICHMENT CYCLES. THESE TAPES CONTAIN DATA IN RAW FORM SIMILAR TO THAT ON THE SOIL ANALYSIS FLIGHT DATA TAPES, BUT THE DATA QUANTITY IS MUCH LESS. THE PARAMETERS ARE MASS SPECTROMETER ELECTRON MULTIPLIER OUTPUT AS A FUNCTION OF TIME FOR EACH MEASUREMENT SCAN AND THE ASSOCIATED BACKGROUND SCAN.

****

INVESTIGATION NAME- LANDER IMAGING

NSSDC ID- 75-075C-06

PERSONNEL

TL - T.A.	MUTCH	BROWN U
TM - C.	SAGAN	CORNELL U
TM - A.B.	BINDER	SCIENCE APPL, INC
TM - E.C.	MORRIS	US GEOLOGICAL SURVEY
TM - F.O.	HUCK	NASA-LARC
TM - E.C.	LEVINTHAL	STANFORD U
TM - S.	LIEBES, JR.	STANFORD U
TM - J.B.	POLLACK	NASA-ARC

BRIEF DESCRIPTION
THE LANDER IMAGING EXPERIMENT VIEWED THE SCENE SURROUNDING THE LANDER, THE SURFACE SAMPLER AND OTHER PARTS OF THE LANDER, THE SUN, PHOBOS, AND DEIMOS TO PROVIDE DATA FOR OPERATIONAL PURPOSES AND FOR GEOLOGICAL AND METEOROLOGICAL INVESTIGATIONS. TWO SCANNING CAMERAS, CAPABLE OF RESOLVING 0.04 DEG (HIGH RESOLUTION) OR 0.12 DEG (LOW RESOLUTION, COLOR, AND IR) WERE USED ON EACH LANDER. EACH IMAGE ACQUIRED COVERED A VERTICAL FIELD OF 20 DEG (HIGH RESOLUTION) OR 60 DEG (LOW RESOLUTION, COLOR, AND IR) AND A HORIZONTAL FIELD THAT WAS COMMANDABLE FROM 2.5 DEG TO 342.5 DEG IN 2.5-DEG INCREMENTS.

IMAGES WERE ACQUIRED FROM 40 DEG ABOVE THE NOMINAL HORIZON TO 60 DEG BELOW, AND WERE COMMANDABLE IN 10-DEG INCREMENTS. THE CAMERAS WERE MOUNTED 1.3 M ABOVE THE NOMINAL LANDING PLANE AND WERE CAPABLE OF VIEWING TWO FOOTPADS AND MOST OF THE AREA ACCESSIBLE TO THE SURFACE SAMPLER. THE TWO CAMERAS WERE SEPARATED BY 0.8 M, AND STEREOSCOPIC PICTURES WERE OBTAINED OVER MOST OF THE SCENE. BLACK AND WHITE IMAGES IN EITHER LOW OR HIGH RESOLUTION INCLUDED RADIATION WAVELENGTHS FROM 0.4 TO 1.1 MICROMETERS. THE USE OF A SINGLE DETECTOR TO IMAGE AN ENTIRE FRAME ALLOWED A RELATIVE RADIOMETRIC ACCURACY OF PLUS OR MINUS 10 PERCENT. FOR MORE INFORMATION CONCERNING THE CAMERAS, SEE HUCK ET AL., SPACE SCIENCE INSTRUMENTATION 1, 189-241 (1975).

****

DATA SET NAME- B/W PRESS RELEASE PHOTOGRAPHY

NSSDC ID- 75-075C-06A

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 07/20/76 TO 07/25/76

QUANTITY OF DATA- 14 FRAMES

BRIEF DESCRIPTION
THESE DATA ARE ON 4- X 5-IN. B/W NEGATIVES RELEASED BY THE PROJECT FOR PUBLIC DISTRIBUTION. THESE PHOTOGRAPHS ARE OF SELECTED SCENES NEAR THE LANDER THAT ARE OF GENERAL INTEREST TO THE PUBLIC. A DESCRIPTION OF EACH PHOTOGRAPH IS INCLUDED.

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DATA SET NAME- COLOR PRESS RELEASE PHOTOGRAPHY

NSSDC ID- 75-075C-06B

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 07/21/76 TO 07/26/76

QUANTITY OF DATA- 4 FRAMES

BRIEF DESCRIPTION
THESE DATA ARE ON 4- X 5-IN. COLOR FILM RELEASED BY THE PROJECT FOR PUBLIC DISTRIBUTION. THESE PHOTOGRAPHS ARE OF SELECTED SCENES NEAR THE LANDER THAT ARE OF GENERAL INTEREST TO THE PUBLIC. A DESCRIPTION OF EACH PHOTOGRAPH IS INCLUDED. THE COLORING CANNOT BE CONSIDERED TO BE ACCURATE BECAUSE OF COLOR INACCURACIES IN REPRODUCTION.

****

DATA SET NAME- EXPERIMENT DATA RECORD (EDR) B/W IMAGES ON FILM

NSSDC ID- 75-075C-06D

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 07/20/76 TO 11/02/76

QUANTITY OF DATA- 704 FRAMES

BRIEF DESCRIPTION
THIS DATA SET, SUPPLIED BY THE LANDER IMAGING TEAM, CONSISTS OF THE B/W EDR VERSION OF THE LANDER PHOTOGRAPHY. THE DATA BLOCK ON EACH FRAME CONTAINS IDENTIFICATION, PROCESSING, AND CAMERA EVENT INFORMATION. THE DATA ARE AVAILABLE ON 5-IN. ROLL FILM OR AS INDIVIDUAL 5- X 5-IN. FRAMES, AND MAY BE ORDERED WITH OR WITHOUT THE DATA BLOCK. THIS TOTAL DATA SET IS A COMPLETE RECORD OF THE LANDER IMAGING DATA AS RECEIVED ON EARTH. THE PICTURE CATALOG OF PRIMARY MISSION EDR (75-075C-06E) SHOULD BE USED TO ORDER EDR IMAGES.

****

DATA SET NAME- PICTURE CATALOG OF PRIMARY MISSION EXPERIMENT DATA RECORD (EDR)

NSSDC ID- 75-075C-06E

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

QUANTITY OF DATA- 5 CARD(S) OF B/W MICROFICHE

BRIEF DESCRIPTION
THESE DATA ARE ON B/W MICROFICHE GENERATED AT NSSDC FROM NASA REFERENCE PUBLICATION 1007 PREPARED BY ROBERT B. TUCKER. THIS PUBLICATION IS A GENERAL REFERENCE FOR THE IMAGING DATA FROM THE VIKING LANDER PRIMARY MISSION. IT PRESENTS THE RESULTS OF THE PROCEDURES THAT WERE APPLIED TO THE IMAGING DATA TO PRODUCE AN ORGANIZED RECORD THAT IS AS COMPLETE AND AS ERROR-FREE AS POSSIBLE. THE RESULT IS CALLED THE EXPERIMENT DATA RECORD. THIS PUBLICATION CONTAINS ALL IMAGES RETURNED BY THE TWO VIKING LANDERS DURING THE PRIMARY MISSION. SKYLINE DRAWINGS DISPLAY THE OUTLINES OF THE IMAGES AS THEY APPEAR IN THE VIEWING AREA. ALSO INCLUDED ARE A SELECTION OF COMPUTER-GENERATED CAMERA EVENT REPORTS THAT LIST SUPPLEMENTAL INFORMATION ABOUT THE CONDITIONS UNDER WHICH THE DATA WERE COLLECTED AND HOW THEY WERE PROCESSED AND RECORDED. IN ADDITION TO A COMPREHENSIVE REPORT, SEVERAL LISTINGS ARE INCLUDED THAT GROUP THE IMAGES IN A VARIETY OF WAYS (E.G., BY TIME OF DAY). A SECTION ON TERMINOLOGY HAS BEEN INCLUDED TO ASSIST WITH THE INTERPRETATION OF THE LISTINGS AND THE IMAGE PRESENTATION. SEVERAL DIAGRAMS ALSO PROVIDE ASSISTANCE ON THIS SUBJECT. THIS PUBLICATION WILL ACQUAINT THE USER WITH THE IMAGING DATA THAT ARE AVAILABLE FROM THE VIKING LANDER PRIMARY MISSION AND THE PROCEDURE USED TO OBTAIN PHOTOGRAPHIC PRODUCTS. IT IS NECESSARY TO ORDER THIS DATA SET TO SELECT EDR IMAGES (75-075C-06D).

****

DATA SET NAME- TEAM DATA RECORD (TDR) B/W IMAGES ON FILM

NSSDC ID- 75-075C-06C

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 07/20/76 TO 11/01/77

QUANTITY OF DATA- 647 FRAMES

BRIEF DESCRIPTION
THESE DATA, SUPPLIED BY THE LANDER IMAGING TEAM, ARE ON 5- X 12-IN. B/W FILM. TDR DATA CONSIST OF THOSE CAMERA EVENTS (CE) FROM THE EDR THOUGHT TO BE OF MOST GENERAL INTEREST. THEY EXCLUDE SUCH THINGS AS SPECIALIZED PHOTOMETRIC SERIES, CALIBRATION AND SCAN VERIFICATION EVENTS, AND SOLAR IMAGES. THE PROCESSING PARAMETERS FOR THE CAMERA EVENTS IN THE TDR WERE CHOSEN TO CREATE PHOTOGRAPHIC PRODUCTS OF THE HIGHEST SCIENTIFIC QUALITY. EACH FRAME IS DIVIDED INTO SEGMENTS, WITH THE DATA BLOCK APPEARING ON THE LAST SEGMENT OF THE CAMERA EVENT. THE TDR AND EDR CE LABELS ARE IDENTICAL. THE TDR VERSION WILL BE USED FOR REQUESTS UNLESS EDR IS SPECIFIED. THE TDR-IPL PRIME MISSION CATALOG (75-075C-06K) SHOULD BE USED TO ORDER TDR IMAGES.

****

DATA SET NAME- TEAM DATA RECORD (TDR) COLOR IMAGES ON FILM

NSSDC ID- 75-075C-06F

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 07/22/76 TO 11/03/76

QUANTITY OF DATA- 45 FRAMES

BRIEF DESCRIPTION
THIS DATA SET, SUPPLIED BY THE LANDER IMAGING TEAM, CONSISTS OF 5- X 12-IN. COLOR IMAGES SELECTED FROM THE B/W TDR IMAGES. THERE ARE GENERALLY TWO VERSIONS OF EACH SCENE. THE TWO VERSIONS REPRESENT THE COLORS AS SEEN ON MARS UNDER MARS LIGHTING CONDITIONS AND AS SEEN ON EARTH UNDER EARTH LIGHTING CONDITIONS. INCLUDED ON EACH FRAME ARE GRAY SCALE WEDGES, DATA BLOCKS, AND COLOR SPECTRUM HISTOGRAMS. OCCASIONALLY, A THIRD TYPE IS GIVEN IN WHICH THE COLOR IS AS ON MARS BUT WAS MADE FROM PRODUCTS THAT DID NOT HAVE THE FULL SIX-CHANNEL DATA ACQUIRED. THIS TYPE IS CALLED 'RADCAM'. THE TDR-IPL PRIME MISSION CATALOG (75-075C-06K) SHOULD BE USED TO ORDER TDR IMAGES. THE COLORING CANNOT BE CONSIDERED TO BE ACCURATE BECAUSE OF COLOR INACCURACIES IN REPRODUCTION.

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DATA SET NAME- TDR-IPL PRIME MISSION CATALOG ON MICROFICHE

ORIGINAL PAGE IS
OF POOR QUALITY

NSSDC ID- 75-075C-06K

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

QUANTITY OF DATA- 2 CARD(S) OF B/W MICROFICHE

BRIEF DESCRIPTION
THIS DATA SET, SUPPLIED BY THE LANDER IMAGING TEAM, IS ON B/W MICROFICHE. THE NECESSARY ORDERING INFORMATION IS CAMERA EVENT (CE) LABEL, VERSION, SEGMENT, AND IPL PIC ID. ENGINEERING PARAMETERS ARE ALSO INCLUDED. AN ASTERISK WITH THE CE LABEL INDICATES THE AVAILABILITY OF A COLOR IMAGE. IT IS NECESSARY TO ORDER THIS DATA SET TO SELECT TDR IMAGES (75-075C-06C AND -06F).

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DATA SET NAME- HIGH-RESOLUTION B/W MOSAICS

NSSDC ID- 75-075C-06H

AVAILABILITY OF DATA SET- DATA IDENTIFIED BUT NOT RECEIVED

BRIEF DESCRIPTION
THIS DATA SET, SUPPLIED BY THE LANDER IMAGING TEAM, CONSISTS OF COMPUTER-GENERATED HIGH-RESOLUTION MOSAICS ON 8- X 10-IN. B/W NEGATIVES. TWO SETS OF MOSAICS WERE PRODUCED: ONE SET FOR IMAGES ACQUIRED EARLY IN THE MORNING AND A SECOND SET FOR IMAGES ACQUIRED IN THE MID-AFTERNOON. THE COMPLETE MOSAICKED SCENE EXTENDS 342.5 DEG IN AZIMUTH. THE IMAGE AREA EXTENDS FROM APPROXIMATELY 5 DEG ABOVE THE HORIZON TO 60 DEG BELOW. THE MOSAIC NEGATIVES HAVE BEEN MADE IN TWO FORMS. IN ONE CASE, USING A 25-MICROMETER SPOT SIZE, THE COMPLETE FOUR QUADRANTS OF A SINGLE MOSAIC ARE CONTAINED ON A SINGLE 8- X 10-IN. NEGATIVE. IN THE SECOND CASE, THREE PRODUCTS ARE MADE

USING A 100-MICROMETER SPOT SIZE. THEY COVER QUADRANTS 1 AND 2, 2 AND 3, AND 3 AND 4 ON EACH OF THREE 8- X 10-IN. NEGATIVES. THE QUADRANT AZIMUTH LIMITS ARE AS FOLLOWS: QUADRANT 1 IS 0 TO 90 DEG, QUADRANT 2 IS 84 TO 174 DEG, QUADRANT 3 IS 168 TO 258 DEG, AND QUADRANT 4 IS 252 TO 342 DEG.

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DATA SET NAME- DONUT PROJECTION IMAGES ON FILM

NSSDC ID- 75-075C-06I

AVAILABILITY OF DATA SET- DATA IDENTIFIED BUT NOT RECEIVED

BRIEF DESCRIPTION
THIS DATA SET, SUPPLIED BY THE LANDER IMAGING TEAM, CONSISTS OF 8- X 10-IN. B/W NEGATIVES OF COMPUTER-GENERATED PANORAMAS PRODUCED TO SHOW A 360-DEG FISHEYE-TYPE IMAGE OF THE MARTIAN TERRAIN WITH THE CAMERA IN THE CENTER OF THE IMAGE. THIS PRODUCES A 'HOLE' WHERE THE CAMERAS COULD NOT SCAN AND HENCE THE NAME 'DONUT'. THEY ARE USEFUL PRIMARILY FOR SHOWING THE LOCATIONS OF FEATURES RELATIVE TO THE LANDERS. EACH DONUT IMAGE WAS CREATED USING A HIGH-RESOLUTION MOSAIC FROM DATA SET 75-075C-06H. THESE MOSAICS WERE SUB-SAMPLED BY A FACTOR OF THREE, REDUCING THE RESOLUTION, TO CONSERVE COMPUTER PROCESSING TIME. THE DONUT IMAGES WERE GENERATED FOR THE SAME TIME PERIODS AS THE MOSAICS.

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INVESTIGATION NAME- METEOROLOGY

NSSDC ID- 75-075C-07

PERSONNEL

TL - S.L.	HESS	FLORIDA STATE U
TM - C.B.	LEOVY	U OF WASHINGTON
TM - R.M.	HENRY	NASA-LARC
TM - J.A.	RYAN	CALIF ST U, FULLERTON
TM - J.E.	TILLMAN	U OF WASHINGTON

BRIEF DESCRIPTION
THIS EXPERIMENT ANALYZED THE METEOROLOGICAL ENVIRONMENT NEAR THE PLANETARY SURFACE AND OBTAINED INFORMATION ABOUT MOTION SYSTEMS OF VARIOUS SCALES. THE ATMOSPHERIC PARAMETERS DETERMINED WERE PRESSURE, TEMPERATURE, WIND SPEED, AND WIND DIRECTION. DIURNAL AND SEASONAL VARIATIONS WERE OF PARTICULAR IMPORTANCE. THE SAMPLING RATES AND DURATIONS FOR ANY ONE MARTIAN DAY WERE SELECTABLE BY GROUND COMMAND. THE SENSORS WERE MOUNTED ON AN ERECTABLE BOOM. THREE HOT-FILM ANEMOMETERS, THROUGH WHICH AN ELECTRIC CURRENT WAS PASSED TO HEAT TWO GLASS NEEDLES COATED WITH PLATINUM AND OVERCOATED WITH ALUMINUM OXIDE, WERE USED TO MEASURE WIND SPEED. THE ELECTRIC POWER NEEDED TO MAINTAIN THESE SENSORS AT A FIXED TEMPERATURE ABOVE THE SURROUNDING AIR WAS THE MEASURE OF WIND SPEED. ATMOSPHERIC TEMPERATURE WAS MEASURED BY THREE FINE-WIRE THERMOCOUPLES IN PARALLEL. A THIN METAL DIAPHRAGM, MOUNTED IN A VACUUM SEALED CASE, WAS USED TO MEASURE ATMOSPHERIC PRESSURE.

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DATA SET NAME- SANMET LISTINGS OF TEMPERATURE AND VECTOR WIND VS TIME

NSSDC ID- 75-075C-07A

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 07/20/76 TO 05/15/77

QUANTITY OF DATA- 208 CARD(S) OF B/W MICROFICHE

BRIEF DESCRIPTION
THIS DATA SET, ON B/W MICROFICHE, CONSISTS OF A COPY OF THE COMPUTER PRINTOUT OF THE SCIENCE ANALYSIS OF METEOROLOGY (SANMET) PROGRAM, WHICH PRESENTS ALL THE INFORMATION ABOUT EVERY MEASUREMENT THAT WAS AVAILABLE TO THE VIKING METEOROLOGY SCIENCE TEAM. RAW DATA (INSTRUMENT VOLTAGE READINGS), REDUCED DATA, AND STATISTICAL SUMMARIES ARE INCLUDED. MUCH OF THE INFORMATION IS REDUNDANT OR OF NO VALUE TO THE USER. FOR EACH MARS DAY THERE ARE FOUR SETS OF DATA LISTINGS: (1) INSTRUMENT VOLTAGE OUTPUTS (RAW DATA); (2) CALCULATED VOLTAGE, RESISTANCE, AND TEMPERATURE VALUES; (3) WIND AND TEMPERATURE DATA IN GEOPHYSICAL UNITS; AND (4) PRESSURE DATA IN GEOPHYSICAL UNITS. THERE IS ALSO INFORMATION ON THE DATA BASE INPUT THAT CONTROLLED THE SANMET RUN AND ON PARITY ERRORS IN THE DATA. THE REDUCED DATA (ITEMS 3 AND 4) WERE USED TO PREPARE THE ABRIDGED DATA SETS -07B AND -07C.

****

DATA SET NAME- HIGH TIME RESOLUTION PLOTS OF VECTOR WIND AND TEMPERATURE VS TIME (SECONDS)

NSSDC ID- 75-075C-07B

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 07/20/76 TO 08/27/76

QUANTITY OF DATA- 1 REEL(S) OF MICROFILM

BRIEF DESCRIPTION
THIS 16-MM MICROFILM DATA SET WAS GENERATED AT NSSDC FROM HARDCOPY REDUCED DATA PLOTS PREPARED BY THE EXPERIMENTER. THE DATA CONSIST OF PLOTS OF THREE PARAMETERS (WIND SPEED, WIND DIRECTION, AND TEMPERATURE) VS TIME (MARS SECONDS) ELAPSED SINCE THE BEGINNING OF THE MEASUREMENT. SUCH INFORMATION AS EARTH START AND STOP TIMES OF THE OBSERVATON IS PRINTED AT THE TOP OF EACH FRAME. NORMALLY THERE IS ONE 5-MIN OBSERVING PERIOD FOR EACH MARS HOUR, EXCEPT THAT THE FIRST OBSERVING PERIOD EACH DAY IS FOR 10 MIN. EACH PLOT DISPLAYS RELATIVELY FINE TIME SCALE DATA TAKEN FOR ONE OF THE HOURLY OBSERVATION PERIODS.

****

DATA SET NAME- LOW TIME RESOLUTION (AVERAGE) PLOTS OF VECTOR WIND AND TEMPERATURE VS TIME (HRS)

NSSDC ID- 75-075C-07C

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 07/20/76 TO 08/27/76

QUANTITY OF DATA- 1 REEL(S) OF MICROFILM

BRIEF DESCRIPTION
THIS 16-MM MICROFILM DATA SET WAS GENERATED AT NSSDC FROM HARDCOPY ANALYZED DATA PREPARED BY THE EXPERIMENTER FROM THE REDUCED DATA IN DATA SET 75-075C-07B. THE DATA CONSIST OF SERIES OF THREE FILM FRAMES, ONE FRAME EACH FOR WIND SPEED, WIND DIRECTION, AND TEMPERATURE. EACH PLOTTED POINT IS OBTAINED BY AVERAGING ALL OBSERVATIONS TAKEN DURING ONE MARS HOUR (MODULE). EACH PLOT DEPICTS DAILY PARAMETER VARIATIONS FOR A PARTICULAR DAY.

****

INVESTIGATION NAME- MAGNETIC PROPERTIES

NSSDC ID- 75-075C-10

PERSONNEL

TL - R.B.	HARGRAVES	PRINCETON U

BRIEF DESCRIPTION
THE MAGNETIC PROPERTIES EXPERIMENT DETECTED THE PRESENCE OF MAGNETIC PARTICLES IN MARTIAN SURFACE MATERIAL. IT USED THREE PAIRS OF SAMARIUM-COBALT MAGNETS, TWO MOUNTED ON THE BACKHOE OF THE SURFACE-SAMPLER COLLECTOR HEAD AND ONE ON TOP OF THE LANDER. EACH PAIR CONSISTED OF AN OUTER RING MAGNET ABOUT 2.5 CM IN DIAMETER WITH AN INNER CORE MAGNET OF OPPOSITE POLARITY. THE MAGNETS WERE DIRECTLY IMAGED BY THE CAMERA SYSTEM IN BLACK AND WHITE AND IN COLOR. A 4-POWER MAGNIFYING MIRROR WAS USED FOR MAXIMUM RESOLUTION.

****

DATA SET NAME- INDEX OF MAGNET IMAGES ON MICROFICHE

NSSDC ID- 75-075C-10A

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 07/20/76 TO 10/06/76

QUANTITY OF DATA- 1 CARD(S) OF B/W MICROFICHE

BRIEF DESCRIPTION
THESE DATA ARE ON B/W MICROFICHE GENERATED AT NSSDC FROM A HARDCOPY INDEX SUPPLIED BY THE INVESTIGATOR. THIS INDEX LISTS THE LANDER CAMERA IMAGES TAKEN OF THE MAGNET PAIRS MOUNTED ON THE SAMPLER ARM AND THE LANDER BODY. THE LISTING CONTAINS THE MARTIAN DAY (SOL); IMAGE REFERENCE NUMBER BY CE LABEL; RESOLUTION; IF COLOR, BLACK AND WHITE, OR INFRARED; IF IN THE SUN OR SHADED; AND COMMENTS.

****

DATA SET NAME- MAGNET IMAGES ON ROLL FILM

NSSDC ID- 75-075C-10B

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 07/20/76 TO 10/06/76

QUANTITY OF DATA- 37 FRAMES

BRIEF DESCRIPTION
THESE DATA ARE ON 5-IN. B/W ROLL FILM GENERATED AT NSSDC FROM LANDER CAMERA IMAGES SUPPLIED BY THE LANDER IMAGING TEAM. THESE DATA ARE THE BEST IMAGES OF THE MAGNET PAIRS TAKEN BY THE LANDER CAMERA. THEY ARE ALSO AVAILABLE AS INDIVIDUAL B/W FRAMES.

****

INVESTIGATION NAME- [illegible]R RADIO SCIENCE

NSSDC ID- 75-075C-11

PERSONNEL

TL - W.H.	MICHAEL, JR.	NASA-LARC
TM - I.I.	SHAPIRO	MASS INST OF TECH
TM - G.	FJELDBO	NASA-JPL
TM - J.G.	DAVIES	U OF MANCHESTER
TM - D.L.	CAIN	NASA-JPL
TM - M.D.	GROSSI	RAYTHEON CORP
TM - G.L.	TYLER	STANFORD U
TM - J.	BRENKLE	NASA-JPL
TM - R.H.	TOLSON	NASA-LARC
TM - C.T.	STELZRIED	NASA-JPL
TM - G.	BORN	NASA-JPL
TM - R.	REASENBERG	MASS INST OF TECH

BRIEF DESCRIPTION

THIS EXPERIMENT USED THE LANDER S-BAND RADIO TRANSMITTER TO ACQUIRE DOPPLER AND RANGE FOR THE LANDER, UTILIZING THE SAME DEEP SPACE NETWORK FACILITIES THAT WERE USED BY THE ORBITERS. THE RESULTING DATA WERE USED TO DETERMINE THE LOCATION OF THE LANDER ON THE PLANET SURFACE. THEY ALSO PROVIDED MORE PRECISE INFORMATION ABOUT THE ORBITAL, ROTATIONAL, AND PRECESSIONAL MOTION OF MARS THAN HAD PREVIOUSLY BEEN AVAILABLE. THE TWO PRINCIPAL DIFFERENCES BETWEEN ORBITER AND LANDER TRACKING DATA ARE: (1) LANDER TRACKING PERIODS ARE NEVER LONGER THAN 2 H AND ARE SOMETIMES MUCH SHORTER BECAUSE OF THERMAL CONSTRAINTS ON THE DURATION OF LANDER TRANSMITTER OPERATION, AND (2) LANDERS HAVE NO X-BAND SIGNALS TO PROVIDE THE CORRECTIONS TO RANGE DATA FOR THE INTERPLANETARY PLASMA EFFECTS. CONSEQUENTLY, LANDER RANGING SESSIONS WERE SCHEDULED TO BE NEARLY SIMULTANEOUS WITH ORBITER RANGING WHENEVER POSSIBLE, SO THAT THE ORBITER S- AND X-BAND DATA COULD SUPPLY THESE CORRECTIONS.

****

DATA SET NAME- DOPPLER AND RANGE TRACKING DATA ON MAGNETIC TAPE

NSSDC ID- 75-075C-11B

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

QUANTITY OF DATA- 1 REEL(S) OF MAGNETIC TAPE

BRIEF DESCRIPTION

THIS DATA SET, SUPPLIED BY THE RADIO SCIENCE TEAM, IS CONTAINED ON 7-TRACK, 800-BPI TAPES THAT ARE MERGED AND REFORMATTED VERSIONS OF THE ORIGINAL PROJECT TRACKING TAPES, AND HAVE ESSENTIALLY THE SAME FORMAT AS THE ORBITER TAPES. EACH RECORD CONTAINS ALL, OR A SUBSET OF, THE FOLLOWING PARAMETERS: TIME, DOPPLER FREQUENCY, RANGE (I.E., LIGHT TIME IN NANOSECONDS), AND CERTAIN TRACKING STATION INFORMATION. SPACING BETWEEN DOPPLER POINTS IS USUALLY 10 S; BETWEEN RANGING POINTS IT IS FROM 2 TO 20 MIN. EACH TAPE CONTAINS DATA FROM ONE SPACECRAFT. A SET OF IBM CARDS LISTING THE RANGE HARDWARE DELAY CALIBRATION DATA IS INCLUDED WITH THESE DATA. THE CALIBRATIONS ARE GIVEN FOR THE COMBINED EFFECT OF THE SIGNAL DELAYS CAUSED BY BOTH A TRACKING STATION'S EQUIPMENT AND THE SPACECRAFT TRANSPONDER.

****

DATA SET NAME- DECALIBRATED LANDER RANGE DATA ON MAGNETIC TAPE

NSSDC ID- 75-075C-11C

AVAILABILITY OF DATA SET- DATA IDENTIFIED BUT NOT RECEIVED

BRIEF DESCRIPTION

THIS DATA SET, SUPPLIED BY THE RADIO SCIENCE TEAM, IS CONTAINED ON 7-TRACK, 800-BPI TAPES. FOR THE 'GOOD' RANGE POINTS, WHICH ARE A SUBSET OF THE RANGE POINTS ON THE TRACKING DATA TAPES (75-075C-11B), THE RESULTS OF AN EXTENSIVE CALIBRATION PROGRAM ARE PRESENTED. THE PARAMETERS LISTED ARE TIME, UNCORRECTED RANGE IN NANOSECONDS, CORRECTION FOR TIME DELAY IN THE LANDER TRANSPONDER, CORRECTION FOR TIME DELAY IN THE TRACKING STATION EQUIPMENT, CORRECTION FOR THE INTERPLANETARY PLASMA EFFECT (FROM NEAR-SIMULTANEOUS ORBITER S- AND X-BAND DATA), AND FINAL CORRECTED RANGE. THE FINAL CORRECTED RANGE SHOULD BE THE BEST OBTAINABLE VALUE OF THE RANGE BETWEEN THE TRACKING STATION ANTENNAS AND THE LANDER.

****

INVESTIGATION NAME- ENTRY SCIENCE NEUTRAL ATMOSPHERIC COMPOSITION

NSSDC ID- 75-075C-12

PERSONNEL

TL - A.O.C.	NIER	U OF MINNESOTA
TM - M.B.	MCELROY	HARVARD U
TM - N.W.	SPENCER	NASA-GSFC

BRIEF DESCRIPTION

THE VIKING ENTRY SCIENCE NEUTRAL ATMOSPHERIC COMPOSITION EXPERIMENT (ONE OF THREE THAT WERE PART OF THE ENTRY SCIENCE INVESTIGATION) WAS DESIGNED TO PROVIDE THE COMPOSITION DATA FOR THE VARIOUS NEUTRAL SPECIES THAT WERE NEEDED TO DEFINE THE PRESENT PHYSICAL AND CHEMICAL STATE OF THE MARTIAN ATMOSPHERE. MOUNTED IN AN OPENING IN THE AEROSHELL WITH ITS ELECTRON-IMPACT OPEN ION SOURCE RECESSED BELOW THE SURFACE OF THE AEROSHELL, A DOUBLE-FOCUSING (ELECTROSTATIC AND MAGNETIC) MASS SPECTROMETER WAS USED TO MEASURE THE CONCENTRATIONS OF THE ATMOSPHERIC SPECIES THAT HAVE MASS-TO-CHARGE RATIOS FROM 1 TO 49. TWO COLLECTORS WERE USED, ONE FOR THE MASS RANGE FROM 1 TO 7 U, AND THE OTHER SIMULTANEOUSLY MEASURING IN THE MASS RANGE FROM 7 TO 49 U. MASS SPECTRA WERE OBTAINED BY SWEEPING THE ION ACCELERATION VOLTAGE AND THE DEFLECTION VOLTAGE ACROSS THE ELECTROSTATIC PLATES. THE SWEEP PERIOD WAS APPROXIMATELY 5 S, AND A DYNAMIC RANGE OF 1.E5 WAS PROVIDED WITHIN EACH SPECTRUM.

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DATA SET NAME- TIME-ORDERED MASS SPECTRA PLOTS ON MICROFILM

NSSDC ID- 75-075C-12A

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 07/20/76 TO 07/20/76

QUANTITY OF DATA- 1 REEL(S) OF MICROFILM

BRIEF DESCRIPTION

THIS 16-MM MICROFILM DATA SET WAS GENERATED AT NSSDC FROM HARDCOPY DATA PLOTS SUPPLIED BY THE INVESTIGATION TEAM. THESE DATA INCLUDE TIME-ORDERED MASS SPECTRA PLOTS DISPLAYED ON A SEMILOG GRAPH. THE ORDINATE SCALE IS ION CURRENT, AND THE LINEAR ABSCISSA SCALE IS WORD NUMBER. BENEATH THE ABSCISSA IS PRINTED SPACECRAFT TIME (MEASURED FROM THE TIME OF DEORBIT) AND UNIVERSAL TIME. WITH THE ACCOMPANYING DOCUMENTATION, IT IS POSSIBLE TO CONVERT CURRENT VALUES TO AMBIENT PARTICLE NUMBER DENSITIES, WORD NUMBER TO ATOMIC MASS, AND TIME INTO ALTITUDE IN KILOMETERS.

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DATA SET NAME- TIME-ORDERED ION CURRENT LISTINGS ON MICROFILM

NSSDC ID- 75-075C-12B

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 07/20/76 TO 07/20/76

QUANTITY OF DATA- 1 REEL(S) OF MICROFILM

BRIEF DESCRIPTION

THIS 16-MM MICROFILM DATA SET WAS GENERATED AT NSSDC FROM HARDCOPY TABULATED DATA PROVIDED BY THE INVESTIGATION TEAM. THESE DATA CONSIST OF THE TIME-ORDERED ION CURRENT LISTINGS FROM WHICH THE MASS SPECTRA PLOTS WERE PRODUCED. THE ITEMS TABULATED INCLUDE: WORD NUMBER, FRAME NUMBER, ELECTROMETER CURRENT READINGS, AND GAIN STEP. AT THE END OF THE FILM ARE ADDITIONAL ION CURRENT DATA NOT IN TEMPORAL ORDER AND MISCELLANEOUS HOUSEKEEPING DATA. THE ACCOMPANYING DOCUMENTS PERMIT THE CONVERSION OF CURRENT TO AMBIENT PARTICLE NUMBER DENSITY, WORD NUMBER TO ATOMIC MASS, AND TIME TO ALTITUDE IN KILOMETERS.

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INVESTIGATION NAME- INORGANIC ANALYSIS

NSSDC ID- 75-075C-13

PERSONNEL

TL - P.	TOULMIN, 3RD	US GEOLOGICAL SURVEY
TM - A.K.	BAIRD	POMONA COLLEGE
TM - K.	KEIL	U OF NEW MEXICO
TM - H.J.	ROSE	US GEOLOGICAL SURVEY
TM - B.C.	CLARK	MARTIN-MARIETTA AEROSP

BRIEF DESCRIPTION

THIS EXPERIMENT UTILIZED AN ENERGY-DISPERSIVE X-RAY FLUORESCENCE SPECTROMETER (XRFS) IN WHICH FOUR SEALED, GAS-FILLED PROPORTIONAL COUNTERS (PC'S) DETECTED X-RAYS EMITTED FROM SAMPLES OF MARTIAN SURFACE MATERIALS IRRADIATED BY X-RAYS FROM RADIOISOTOPE SOURCES (IRON-55 AND CADMIUM-109). THE OUTPUT OF THE PROPORTIONAL COUNTERS WAS SUBJECTED TO PULSE HEIGHT ANALYSIS BY AN ONBOARD STEP-SCANNING, SINGLE-CHANNEL ANALYZER WITH ADJUSTABLE COUNTING PERIODS. THIS INSTRUMENT WAS LOCATED INSIDE THE LANDER BODY, AND SAMPLES WERE DELIVERED TO IT BY THE LANDER SURFACE SAMPLER. CALIBRATION STANDARDS WERE AN INTEGRAL PART OF THE INSTRUMENT. RECONSTRUCTED SPECTRA YIELDED SURFACE COMPOSITION DATA WITH ACCURACIES RANGING FROM A FEW TENS OF PARTS PER MILLION FOR TRACE ELEMENTS TO A FEW PERCENT FOR MAJOR ELEMENTS.

ORIGINAL PAGE IS
OF POOR QUALITY

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DATA SET NAME- SPECTRA PLOTS ON MICROFICHE

NSSDC ID- 75-075C-13A

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 07/20/76 TO 11/03/76

QUANTITY OF DATA- 18 CARD(S) OF B/W MICROFICHE

BRIEF DESCRIPTION
THIS DATA SET CONSISTS OF B/W MICROFICHE PROVIDED BY THE INVESTIGATION TEAM CONTAINING LOGARITHMIC PLOTS OF THE DATA IN THE SPECTRAL HISTORY FILE (SEE 75-075C-13E). THE TITLE ON EACH PLOT INCLUDES LANDER ID, SPECTRUM NUMBER, PC TUBE, SAMPLE OR CALIBRATION INFORMATION, COMMAND HISTORY INFORMATION, COUNT PERIOD (IF OTHER THAN 7.7 S), OPERATOR, DETECTOR VOLTAGE, AND DATE. THE X-AXIS REPRESENTS ENERGY (CHANNEL NUMBER), AND THE Y-AXIS REPRESENTS INTENSITY THAT HAS BEEN NORMALIZED TO REFLECT A 30.7-S COUNT PERIOD/CHANNEL. THE PC 1 AND 2 DATA REPRESENT THE IRON-55 RADIATION SOURCE INFORMATION WHILE PC 3 AND 4 DATA REPRESENT THE CADMIUM-109 INFORMATION.

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DATA SET NAME- COMMAND, SPECTRA, AND TEMPERATURE HISTORY ON MAGNETIC TAPE

NSSDC ID- 75-075C-13E

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 07/20/76 TO 10/29/76

QUANTITY OF DATA- 1 REEL(S) OF MAGNETIC TAPE

BRIEF DESCRIPTION
THESE DATA ARE ON 7-TRACK, 800-BPI, BCD, EVEN PARITY MAGNETIC TAPE SUPPLIED BY THE INVESTIGATION TEAM. EACH TAPE CONTAINS THREE FILES. THE COMMAND HISTORY (FILE 1) CONTAINS THE INSTRUMENT PARAMETERS THAT WERE SENT TO THE GUIDANCE CONTROL AND SEQUENCING COMPUTER (GCSC). THE FILE CONSISTS OF A HEADER; THE NUMBER OF COMMANDS IN EACH GROUP; THE NUMBER OF THE FIRST COMMAND IN EACH GROUP; THE PURPOSE; THE COMMAND TABLE NUMBER; THE NUMBER OF THE OFFSET ENTRY; THE PC TUBE NUMBER; THE HIGH-VOLTAGE BIAS; THE CODE USED TO IDENTIFY DUMP, FLAG, OR SAMPLE INFORMATION; THE COUNT PERIOD PER CHANNEL; THE WINDOW GROUP (START CHANNEL); THE EXECUTION TIME; THE TIME IN SECONDS TO BEGIN EXECUTION ON MARS; AND THE PREDICTED NUMBER OF DATA FRAMES. THE TEMPERATURE HISTORY FILE (FILE 2) CONTAINS TEMPERATURE MEASUREMENTS IN THE XRFS BOX. THE FILE CONSISTS OF A HEADER, THE TOTAL NUMBER OF TEMPERATURE GROUPS AS PROVIDED BY THE VIKING DATA SOFTWARE (EACH GROUP CONTAINS A MAXIMUM OF 675 MEASUREMENTS), THE NUMBER OF GROUPS STORED IN THE FILE, THE TEMPERATURE READINGS IN THE XRFS BOX, AND THE GCSC TIME (IN SECONDS) WHEN EACH TEMPERATURE WAS MEASURED. THE SPECTRAL HISTORY FILE (FILE 3) CONTAINS THE INSTRUMENT RESPONSE DATA. THE FILE CONSISTS OF A HEADER, THE SPECTRUM NAME, RAW SPECTRUM DATA NORMALIZED TO A COUNT TIME OF 30.7 S PER CHANNEL, THE PC TUBE THAT GENERATED THE SPECTRUM, THE TIME AND DATE THE SPECTRUM WAS ASSEMBLED AT JPL, THE DATA FRAME NUMBERS USED TO MAKE THE SPECTRUM, THE COUNT PERIOD FOR EACH DATA FRAME, AND THE NAME OF THE OPERATOR WHO GENERATED THE SPECTRUM.

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INVESTIGATION NAME- ENTRY SCIENCE IONOSPHERIC PROPERTIES

NSSDC ID- 75-075C-14

PERSONNEL

TL -	A.O.C.NIER	U OF MINNESOTA
TM -	W.B. HANSON	U OF TEXAS, DALLAS
TM -	N.W. SPENCER	NASA-GSFC

BRIEF DESCRIPTION
THE VIKING ENTRY SCIENCE IONOSPHERIC PROPERTIES EXPERIMENT (ONE OF THREE THAT WERE PART OF THE ENTRY SCIENCE INVESTIGATION) STUDIED THE COMPOSITION, STRUCTURE, AND TEMPERATURE OF THE IONOSPHERE, WHICH WERE PROBED DURING THE DESCENT OF THE LANDER CAPSULE BY MEANS OF A RETARDING POTENTIAL ANALYZER (RPA) MOUNTED FLUSH WITH THE FRONT FACE OF THE AEROSHELL. TO CONSERVE BATTERY POWER, THE INSTRUMENT WAS OPERATED INTERMITTENTLY BETWEEN 16,000 AND 5,000 KM ALTITUDE BUT CONTINUOUSLY FROM 5,000 TO 100 KM. THE INSTRUMENT COMPRISED A CURRENT-COLLECTING PLATE WITH SEVEN GRIDS AHEAD OF IT. A FIXED PROGRAM OF POTENTIALS WAS APPLIED TO THE GRIDS, AND THE COLLECTED CURRENTS WERE MEASURED AT 10-MS INTERVALS. THE INSTRUMENT OPERATED IN THREE PHASES TO MEASURE ENERGETIC ELECTRONS, THERMAL ELECTRONS, AND THERMAL IONS.

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DATA SET NAME- TRAJECTORY AND ATTITUDE DATA ON TAPE

NSSDC ID- 75-075C-14A

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 07/20/76 TO 07/20/76

QUANTITY OF DATA- 1 REEL(S) OF MAGNETIC TAPE

BRIEF DESCRIPTION
THESE DATA, SUPPLIED BY THE INVESTIGATION TEAM, ARE ON 9-TRACK, BINARY, 1600-BPI, UNLABELED TAPE, AND CONTAIN TRAJECTORY AND ATTITUDE DATA FOR THE VIKING 1 AND 2 LANDERS. THERE IS ONE FILE FOR EACH SPACECRAFT. EACH RECORD IN A FILE CONTAINS THE FOLLOWING PARAMETERS: TIME IN SECONDS FROM DEORBIT; VELOCITY IN KM/S; ALTITUDE ABOVE MARS' MEAN SURFACE IN KILOMETERS; AND FLIGHT ANGLE, HEADING ANGLE, SUB-LANDER LATITUDE, SUB-LANDER LONGITUDE, RPA ANGLE OF ATTACK, UAMS ANGLE OF ATTACK, RPA SUN ANGLE, AND ZENITH ANGLE ALL MEASURED IN DEGREES.

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DATA SET NAME- RPA ION AND ELECTRON DATA ON TAPE

NSSDC ID- 75-075C-14B

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 07/20/76 TO 07/20/76

QUANTITY OF DATA- 1 REEL(S) OF MAGNETIC TAPE

BRIEF DESCRIPTION
THESE DATA, SUPPLIED BY THE INVESTIGATION TEAM, ARE ON 9-TRACK, 1600-BPI, BINARY TAPE. THE DATA CONTAIN THE COMPLETE RECORD OF THE COLLECTED CURRENT VS RETARDING POTENTIAL AS A FUNCTION OF TIME FOR BOTH LANDERS IN BOTH THE ELECTRON AND ION MODES. THERE ARE FOUR FILES ON THIS TAPE, AND EACH RECORD CONTAINS TIME IN SECONDS FROM DEORBIT, SEQUENTIAL FRAME NUMBER, MAJOR FRAME NUMBER, AND PAIRS OF RETARDING POTENTIAL AND COLLECTOR CURRENT VALUES.

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DATA SET NAME- RPA ION AND ELECTRON DATA ON MICROFILM

NSSDC ID- 75-075C-14C

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 07/20/76 TO 07/20/76

QUANTITY OF DATA- 2 REEL(S) OF MICROFILM

BRIEF DESCRIPTION
THESE DATA, SUPPLIED BY THE INVESTIGATION TEAM, ARE ON 16-MM MICROFILM. THE DATA ARE ESSENTIALLY THE SAME AS THE MAGNETIC TAPE DATA SET (75-075C-14B) AND INCLUDE CURRENT VS RETARDING POTENTIAL PLOTS FOR EACH INDIVIDUAL SWEEP IN THE ENERGETIC ELECTRON MODE; SIMILAR PLOTS FOR THERMAL IONS WITH THE LEAST-SQUARES FIT TO THE THEORETICAL EQUATION TO DETERMINE CONCENTRATIONS, TEMPERATURE, AND OTHER PARAMETERS; AND TIME PLOTS OF ALTITUDE, VELOCITY, AND PERTINENT ANGLES TO DEFINE THE INSTRUMENT ENVIRONMENT DURING THE ENTRY.

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SPACECRAFT COMMON NAME- VIKING 2 ORBITER

NSSDC ID- 75-083A

LAUNCH DATE- 09/09/75

ORBIT PARAMETERS

ORBIT TYPE- AREOCENTRIC	EPOCH DATE- 08/09/76
ORBIT PERIOD- 1639. MIN	INCLINATION- 55.2 DEG
PERIAPSIS- 1499. KM	APOAPSIS- 35800. KM

PERSONNEL

MG -	W. JAKOBOWSKI	NASA HEADQUARTERS
SC -	R.S. YOUNG	NASA HEADQUARTERS
PM -	K.S. WATKINS	NASA-JPL
PS -	C.W. SNYDER	NASA-JPL

BRIEF DESCRIPTION
THE VIKING SPACECRAFT CONSISTED OF AN ORBITER AND A LANDER. THE LANDER SEPARATED FROM THE ORBITER, ENTERED THE MARTIAN ATMOSPHERE, AND SOFT-LANDED SEPTEMBER 3, 1976. SCIENTIFIC DATA WERE COLLECTED AND TRANSMITTED TO EARTH FROM THE LANDER DURING ENTRY AND WHILE IT WAS ON THE SURFACE, AND FROM THE ORBITER BEFORE AND AFTER LANDER SEPARATION. THE ORBITER WAS A SOLAR-CELL-POWERED SATELLITE STABILIZED IN THREE AXES USING INERTIAL AND CELESTIAL REFERENCES. THERE WAS A 500-W POWER CAPACITY FOR THE ORBITER. IT CARRIED INSTRUMENTS FOR CONDUCTING IMAGING, ATMOSPHERIC WATER VAPOR, THERMAL MAPPING, AND RADIO SCIENCE INVESTIGATIONS. THE SCIENTIFIC AND PHOTOGRAPHIC ANALYSIS INSTRUMENTS HAD A MASS OF APPROXIMATELY 72 KG (158 LB).

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INVESTIGATION NAME- ORBITER IMAGING

NSSDC ID- 75-083A-01

PERSONNEL

TL - M.H.	CARR	US GEOLOGICAL SURVEY
TM - W.A.	BAUM	LOWELL OBSERVATORY
TM - H.	MASURSKY	US GEOLOGICAL SURVEY
TM - G.A.	BRIGGS	NASA-JPL
TM - J.A.	CUTTS	SCIENCE APPL, INC
TM - T.C.	DUXBURY	NASA-JPL
TM - K.R.	BLASIUS	PLANETARY SCIENCE INST
TM - R.	GREELEY	ARIZONA STATE U
TM - J.E.	GUEST	U OF LONDON
TM - K.A.	HOWARD	US GEOLOGICAL SURVEY
TM - B.A.	SMITH	U OF ARIZONA
TM - L.A.	SODERBLOM	US GEOLOGICAL SURVEY
TM - J.	VEVERKA	CORNELL U
TM - J.B.	WELLMAN	NASA-JPL

BRIEF DESCRIPTION
THE VIKING VISUAL IMAGING SUBSYSTEM (VIS) CONSISTED OF TWIN HIGH-RESOLUTION, SLOW-SCAN TELEVISION FRAMING CAMERAS MOUNTED ON THE SCAN PLATFORM OF EACH ORBITER WITH THE OPTICAL AXES OFFSET BY 1.38 DEG. EACH OF THE TWO IDENTICAL CAMERAS ON EACH ORBITER HAD A 475-MM FOCAL LENGTH TELESCOPE; A 37-MM DIAMETER VIDICON, THE CENTRAL SECTION OF WHICH WAS SCANNED IN A RASTER FORMAT OF 1056 LINES BY 1182 SAMPLES; AND SIX COLOR FILTERS TO RESTRICT THE SPECTRAL BANDPASS OF AN IMAGE TO LIMITED PORTIONS OF THE CAMERAS' NEAR-VISUAL RESPONSE CHARACTERISTICS. EACH FIELD OF VIEW WAS 1.54 DEG X 1.69 DEG WITH EACH PICTURE ELEMENT (PIXEL) SUBTENDING 25 MICRORADIANS. THE SLIGHT OFFSET OF THE OPTICAL AXES AND THE ALTERNATE SHUTTERING MODE OF OPERATION (THE INTERVAL BETWEEN FRAMES BEING 4.48 S) PROVIDED OVERLAPPING, WIDE-SWATH COVERAGE OF THE SURFACE. INDIVIDUAL IMAGES ARE IDENTIFIED BY PICTURE NUMBER (PICNO), WHICH IS A UNIQUE IDENTIFIER OF THE SCENE. ELEMENTS OF THE PICNO ARE AS FOLLOWS: THE FIRST THREE DIGITS DENOTE THE REVOLUTION (REV) DURING WHICH THE IMAGE WAS SHUTTERED; LETTER A IS VIKING ORBITER 1, B IS VIKING ORBITER 2; AND THE LAST TWO DIGITS ARE THE FRAME NUMBER.

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DATA SET NAME- B/W PRESS RELEASE PHOTOGRAPHY

NSSDC ID- 75-083A-01A

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 10/16/75 TO 12/26/76

QUANTITY OF DATA- 9 FRAMES

BRIEF DESCRIPTION
THIS DATA SET CONSISTS OF 4- X 5-IN. B/W NEGATIVES THAT WERE RELEASED BY THE PROJECT FOR PUBLIC DISTRIBUTION BECAUSE THEY WERE OF PARTICULAR INTEREST. MOST SHOW MARS SURFACE FEATURES, BUT ONE IS THE FIRST PHOTOGRAPH OF THE EARTH SEEN FROM MORE THAN 10 MILLION KM IN SPACE AND SHOWS THE EARTH IN A CRESCENT PHASE. DECRIPTIONS OF EACH PHOTOGRAPH ARE INCLUDED.

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DATA SET NAME- B/W RECTILINEAR PHOTOGRAPHY

NSSDC ID- 75-083A-01D

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 08/12/76 TO 03/29/77

QUANTITY OF DATA- 8126 FRAMES

BRIEF DESCRIPTION
THESE DATA, SUPPLIED BY THE ORBITER IMAGING TEAM, ARE ON 5- X 5-IN. B/W FILM AND REPRESENT THE SURFACE AS VIEWED FROM THE ORBITER SCAN PLATFORM WITHOUT GEOMETRIC CORRECTIONS FOR OBLIQUE-VIEWING DISTORTION. MOST IMAGES ARE AVAILABLE IN TWO PROCESSED VERSIONS: THE SHADING CORRECTED (SCR2) VERSION, SUITABLE FOR ALBEDO CONTRAST AND PHOTOGRAMMETRIC STUDIES; AND (2) THE HIGH-PASS FILTERED (NGF) VERSION, WHICH PROVIDES MAXIMUM FEATURE DISCRIMINABILITY (AT THE COST OF TRUE ALBEDO CONTRAST). BOTH VERSIONS HAVE BEEN PROCESSED TO REMOVE OR FILL IN TELEMETRY BIT ERRORS, CAMERA BLEMISHES, AND NONUNIFORMITIES IN VIDICON RESPONSE. CORRECTED DATA ARE THEN LINEARLY STRETCHED IN CONTRAST TO FILL THE DYNAMIC RANGE OF THE FILM. EACH PROCESSED PICTURE HAS A DATA BLOCK CONTAINING ALL PERTINENT INFORMATION FOR THE IMAGE. TO SELECT THESE DATA, USE THE SEDR (75-083A-01G); THE RECTILINEAR AND ORTHOGRAPHIC PHOTOGRAPHY INDEX (75-083A-01K); THE QUADRANT, LATITUDE, AND LONGITITUDE INDEX (75-083A-01M); OR THE 10-DEG BOX INDEX (75-083A-01H). FOR ORDERING, SPECIFY BOTH THE PICNO AND THE ROLL/FILE NUMBER.

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DATA SET NAME- B/W ORTHOGRAPHIC PHOTOGRAPHY

NSSDC ID- 75-083A-01E

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 08/12/76 TO 11/27/77

QUANTITY OF DATA- 710 FRAMES

BRIEF DESCRIPTION
THESE DATA, SUPPLIED BY THE ORBITER IMAGING TEAM, ARE ON 5- X 5-IN. B/W FILM AND ARE A SUBSET OF THE TOTAL IMAGE SET THAT HAS BEEN TRANSFORMED TO AN ORTHOGRAPHIC MAPPING PROJECTION SO THAT THE SCENE APPEARS AS IF VIEWED FROM DIRECTLY OVERHEAD. THE CENTER OF PROJECTION IN ALL CASES IS THE CENTER POINT OF THE FRAME. TO PRESERVE MAXIMUM DISCRIMINABILITY OF FEATURES, THE SIZE OF THE PROJECTED IMAGE IS FORMATTED TO FILL, AS NEARLY AS POSSIBLE, THE MASK DIMENSIONS (1584 PIXELS SQUARE). THEREFORE, THE SCALE WILL VARY FROM IMAGE TO IMAGE IN A SERIES. THIS IS ESPECIALLY EVIDENT IN THOSE SEQUENCES OBTAINED AT PERIAPSIS WHEN THE VIEWING GEOMETRY AND RANGE ARE CHANGING MOST RAPIDLY. THE SCALE OF EACH IMAGE IS GIVEN IN THE DATA BLOCK UNDER SCO (KM/PIXEL). A SCALE BAR TO THE RIGHT OF THE IMAGE FACILITATES PHOTOGRAPHIC RECONSTRUCTION OF A SERIES OF IMAGES TO A SIMILAR SCALE. NOT ALL IMAGES ARE AVAILABLE IN THE ORTHOGRAPHIC VERSION. MOST ORTHOGRAPHIC IMAGES AVAILABLE WERE PRODUCED IN THE NGF VERSION AND, THEREFORE, DO NOT PRESENT TRUE ALBEDO CHARACTERISTICS. TO SELECT THESE DATA, USE THE SEDR (75-083A-01G); THE RECTILINEAR AND ORTHOGRAPHIC PHOTOGRAPHY INDEX (75-083A-01K); THE QUADRANT, LATITUDE, AND LONGITUDE INDEX (75-083A-01M); OR THE 10-DEG BOX INDEX (75-083A-01H). FOR ORDERING, SPECIFY BOTH THE PICNO AND ROLL/FILE NUMBER.

****

DATA SET NAME- RECTILINEAR AND ORTHOGRAPHIC PHOTOGRAPHY INDEXES ORDERED BY ROLL/FILE NUMBER

NSSDC ID- 75-083A-01K

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

QUANTITY OF DATA- 4 CARD(S) OF B/W MICROFICHE

BRIEF DESCRIPTION
THIS DATA SET IS ON B/W MICROFICHE GENERATED AT NSSDC FROM HARDCOPY SUPPLIED BY THE ORBITER IMAGING TEAM. THE DATA ARE AN INDEX TO THE RECTILINEAR (75-083A-01D) AND ORTHOGRAPHIC (75-083A-01E) PHOTOGRAPHY, AND ARE SORTED BY ROLL/FILE NUMBER. THE INDEX LISTS THE PICTURE NUMBER (PICNO) AND THE VERSION (PROCLAB). THE INDEX IS PERIODICALLY UPDATED BY THE IMAGING TEAM.

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DATA SET NAME- 10-DEG BOX INDEX AND LATITUDE AND LONGITUDE INDEX ON MICROFICHE

NSSDC ID- 75-083A-01H

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

QUANTITY OF DATA- 1 CARD(S) OF B/W MICROFICHE

BRIEF DESCRIPTION
THIS DATA SET, SUPPLIED BY THE ORBITER IMAGING TEAM, IS ON B/W MICROFICHE. IT CONSISTS OF TWO INDEXES: ONE LISTS THE IMAGES BY CENTER LATITUDE, AND THE OTHER LISTS THE IMAGES BY 10-DEG BOXES OF LATITUDE AND LONGITUDE. THE FIRST BOX IS AT 0-DEG LONGITUDE AND THE NORTH POLE, AND COVERS THE AREA 0-DEG TO 10-DEG W LONGITUDE AND 90-DEG TO 80-DEG N LATITUDE. THE SECOND BOX IS 10-DEG TO 20-DEG W LONGITUDE AND 90-DEG TO 80-DEG N LATITUDE. THE LATITUDE AND LONGITUDE OF THE INTERCEPT POINT 5 (CENTER OF IMAGE) ARE USED FOR THESE COMPUTATIONS, AND ONLY IMAGES WHERE THE INTERCEPT POINT 5 IS ON THE PLANET (EMA5 LT 90-DEG) ARE LISTED. EACH INDEX CONTAINS THESE PARAMETERS: PICNO; FRAME START COUNT (FSC) NUMBER; CENTER LATITUDE; CENTER LONGITUDE; EMISSION ANGLE, THE ANGLE BETWEEN THE SURFACE NORMAL AND THE LINE TO THE SPACECRAFT; INCIDENCE ANGLE, THE ANGLE BETWEEN THE SURFACE NORMAL AND THE LINE TO THE SUN; RANGE TO SURFACE; AND MARS TIME.

****

DATA SET NAME- INDEX OF IMAGES ORDERED BY QUADRANT, LATITUDE, AND LONGITUDE ON MICROFILM

NSSDC ID- 75-083A-01M

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

QUANTITY OF DATA- 1 REEL(S) OF MICROFILM

BRIEF DESCRIPTION
THESE DATA, SUPPLIED BY THE ORBITER IMAGING TEAM, ARE AN INDEX OF RECTILINEAR, ORTHOGRAPHIC, AND MOSAIC IMAGES ORDERED BY QUADRANT, LATITUDE, AND LONGITUDE ON 16-MM MICROFILM GENERATED AT NSSDC FROM HARDCOPY. A QUADRANT IS ONE OF THE 30 SECTIONS INTO WHICH THE MARS SURFACE IS DIVIDED ON THE SET OF USGS 1:5,000,000 SCALE MAPS. THE INFORMATION LISTED INCLUDES PICNO, CENTER LATITUDE, CENTER LONGITUDE, INCIDENCE ANGLE,

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OF POOR QUALITY

EMISSION ANGLE, FILTER, RANGE TO SURFACE, SCR-2 VERSION, NGF VERSION, ORTHOGRAPHIC PROJECTION VERSION, AND FOUR POSSIBLE MOSAIC APPEARANCES. THIS IS CONSIDERED THE BEST AND MOST COMPLETE INDEX FOR ORDERING ORBITER IMAGES FROM NSSDC.

****

DATA SET NAME- PHOBOS, DEIMOS, STAR, LIMB, AND TERMINATOR IMAGES INDEX ON MICROFICHE

NSSDC ID- 75-083A-01J

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

QUANTITY OF DATA- 1 CARD(S) OF B/W MICROFICHE

BRIEF DESCRIPTION
THIS DATA SET, SUPPLIED BY THE ORBITER IMAGING TEAM, IS AN INDEX OF IMAGES OF THE MARTIAN MOONS, STARS, MARS TERMINATOR, AND MARS LIMB ON B/W MICROFICHE. IT LISTS PICNO; FILTER; EXPOSURE; THE RANGE FROM THE ORBITER TO PHOBOS, DEIMOS, AND THE LIMB OF MARS; AND THE SURFACE COORDINATES OF THE CORNER OR CENTER OF THE PICTURE, IF MARS APPEARS IN THE PICTURE. A 'TERMINATOR' PICTURE IS DEFINED AS A PICTURE FOR WHICH AT LEAST ONE CORNER IS ON THE UNLIGHTED PORTION OF THE MARS SURFACE. A 'LIMB' PICTURE HAS AT LEAST ONE CORNER OFF THE SURFACE ENTIRELY.

****

DATA SET NAME- SEDR PHOTOGRAPHIC SUPPORT DATA ON MICROFICHE

NSSDC ID- 75-083A-01G

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

QUANTITY OF DATA- 9 CARD(S) OF B/W MICROFICHE

BRIEF DESCRIPTION
THESE DATA ARE ON B/W MICROFICHE SUPPLIED BY THE ORBITER IMAGING TEAM. THIS DATA SET IS DERIVED FROM THE VIKING SUPPLEMENTARY EXPERIMENT DATA RECORD (SEDR). IT DEFINES THE GEOMETRICAL AND OTHER OBSERVATIONAL CONDITIONS THAT PERTAINED TO EVERY VIS FRAME ACQUIRED. PICTURES ARE LISTED IN CHRONOLOGICAL ORDER OF ACQUISITION, IDENTIFIED BY PICNO WITH SIX FRAMES ON A PAGE. SEVENTY-EIGHT PARAMETERS, WHICH INCLUDE THE FOLLOWING TYPES OF INFORMATION, ARE INCLUDED: TIME OF THE EVENT; CAMERA INFORMATION, INCLUDING IDENTIFICATION AND EXPOSURE; ORBITER POSITION AND CAMERA ORIENTATION; FRAME SIZE AND ORIENTATION ON THE SURFACE; LATITUDE, LONGITUDE, AND RANGE FOR THE CENTER AND CORNERS OF THE FRAME; VIEWING ANGLE, LIGHTING ANGLE, AND PHASE ANGLE OF THE CENTER AND CORNERS; AND ROLL AND FRAME NUMBERS FOR IDENTIFYING DIFFERENT PROCESSED VERSIONS OF EACH FRAME.

****

DATA SET NAME- PRIME MISSION PICTURE CATALOG ON MICROFICHE

NSSDC ID- 75-083A-01L

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 08/05/76 TO 11/07/76

QUANTITY OF DATA- 96 CARD(S) OF B/W MICROFICHE

BRIEF DESCRIPTION
THIS DATA SET IS ON B/W MICROFICHE SUPPLIED BY THE ORBITER IMAGING TEAM. THE MICROFICHE CARDS ARE IN COSATI FORMAT WITH 60 IMAGES PER CARD. THE TOP ROW OF EACH CARD CONTAINS DESCRIPTIVE INFORMATION SUCH AS (1) SPACECRAFT IDENTIFICATION, AND SEQUENCE NUMBER, (2) GRAY SCALE CONTROL, (3) RESOLUTION CONTROL FRAME, (4) FIRST AND LAST PICNO'S ON THE CARD, AND (5) ANY MTIS TARGET FRAMES THAT MAY HAVE ACCOMPANIED THE IMAGES ON THE CARD. THE IMAGES ARE ARRANGED BY PICNO AND VERSION. QUALITY OF THE MICROFICHE IS EXCELLENT.

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DATA SET NAME- B/W MOSAICS

NSSDC ID- 75-083A-01B

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 08/12/76 TO 11/27/77

QUANTITY OF DATA- 95 FRAMES

BRIEF DESCRIPTION
THESE DATA, SUPPLIED BY THE ORBITER IMAGING TEAM, ARE 4-X 5-IN. B/W MOSAICS. HAND-RENDERED MOSAICS ARE AVAILABLE FOR MUCH OF THE COVERAGE OBTAINED BY THE VIKING ORBITER CAMERAS. FOR THE MOST PART, THESE MOSAICS PROVIDE CONTIGUOUS COVERAGE OF SCENES MADE UP FROM INDIVIDUAL IMAGES AND NO ATTEMPT HAS BEEN MADE TO CONFORM TO A GLOBAL CONTROL NET. MEASUREMENTS MADE FROM THESE MOSAICS WILL BE HIGHLY INACCURATE. MOSAICS PRODUCED BY THE UNITED STATES GEOLOGICAL SURVEY (USGS) DESIGNATED AS MC QUADS OR MC SUBQUADS AND BUILT UPON THE APPROPRIATE SHADED RELIEF MAP ARE VALID MAPPING COVERAGE. EACH MOSAIC, IDENTIFIED BY THE PREFIX 211- AND A FOUR-DIGIT NUMBER, IS SUPPLIED WITH A FOOTPRINT PLOT PROVIDING THE INDIVIDUAL PICNO AS WELL AS ROLL AND FILE ORDER NUMBERS FOR THE INDIVIDUAL FRAMES MAKING UP THE MOSAIC. ALL OF THESE NUMBERS SHOULD BE SPECIFIED WHEN ORDERING INDIVIDUAL FRAMES. IN A FEW CASES WHERE THE PARTICULAR VERSION OF A FRAME IN THE MOSAIC IS NOT AVAILABLE, A SIMILAR VERSION OF THAT FRAME IS DESIGNATED ON THE FOOTPRINT PLOT. THE MOSAIC SUMMARY AND INDEX (75-083A-01I) SHOULD BE USED TO SELECT THESE DATA.

****

DATA SET NAME- MOSAIC SUMMARY AND INDEX ON MICROFICHE

NSSDC ID- 75-083A-01I

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

QUANTITY OF DATA- 1 CARD(S) OF B/W MICROFICHE

BRIEF DESCRIPTION
THIS DATA SET, SUPPLIED BY THE ORBITER IMAGING TEAM, CONSISTS OF A SUMMARY AND INDEX OF VIKING ORBITER MOSAICS ON B/W MICROFICHE. THE SUMMARY CONTAINS IDENTIFICATION NUMBER, MOSAIC ID, COMMENTS (AREA OR FEATURES IN VIEW), PRODUCTION TIME, REVOLUTION NUMBER, NUMBER OF IMAGES MOSAICKED, MINIMUM AND MAXIMUM LATITUDE, AND MINIMUM AND MAXIMUM LONGITUDE. THIS SUMMARY IS FOLLOWED BY AN INDEX ORDERED BY PICNO NUMBER THAT CROSS-REFERENCES THE PAGE NUMBER OF THE MOSAIC IN THE SUMMARY SECTION. THE INDEX INCLUDES PICNO, CENTRAL LATITUDE, AND CENTRAL LONGITUDE OF EACH PHOTO IN THE MOSAIC.

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DATA SET NAME- B/W STEREO PAIRS

NSSDC ID- 75-083A-01F

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 09/22/76 TO 04/24/77

QUANTITY OF DATA- 24 FRAMES

BRIEF DESCRIPTION
THESE DATA, SUPPLIED BY THE ORBITER IMAGING TEAM, ARE ON 5- X 5-IN. B/W FILM AND CONSIST OF FRAMES IDENTIFIED AS HAVING OVERLAPPING COVERAGE. STEREO STUDIES OF VIKING IMAGES ARE STILL IN THE EARLIEST STAGES AND NO STEREO PRODUCT AS SUCH HAS BEEN DEFINED. FRAMES SHOULD BE ORDERED IN THE ORTHOGRAPHIC VERSION FOR STEREO STUDIES. IT SHOULD BE UNDERSTOOD THAT THE VISUAL IMAGING SUBSYSTEM ON THE VIKING ORBITERS WAS NOT WELL ADAPTED FOR ACQUIRING STEREO DATA, AND THAT THEIR ACQUISITION WAS NOT A MAJOR OBJECTIVE OF THE PRIMARY MISSION. THE PAIRS CONTAIN SIGNIFICANT BUT VARIABLE AMOUNTS OF OVERLAP. IN SOME CASES THE TWO FRAMES WERE TAKEN AT WIDELY DIFFERENT TIMES SO THAT LIGHTING CONDITIONS DID NOT MATCH WELL. STEREO COVERAGE OF HIGHER QUALITY AND GREATER QUANTITY WAS OBTAINED IN THE EXTENDED MISSION AND WILL BE AVAILABLE AT A LATER TIME.

****

INVESTIGATION NAME- INFRARED THERMAL MAPPING (IRTM)

NSSDC ID- 75-083A-02

PERSONNEL

TL -	H.H.	KIEFFER	U OF CALIF, LA
TM -	G.	MUNCH	CALIF INST OF TECH
TM -	E.D.	MINER	NASA-JPL
TM -	G.	NEUGEBAUER	CALIF INST OF TECH
TM -	S.C.	CHASE, JR.	SANTA BARBARA RES CTR

BRIEF DESCRIPTION
THE PURPOSE OF THE IRTM EXPERIMENT WAS TO MEASURE THE TEMPERATURES OF THE ATMOSPHERE AND AREAS ON THE SURFACE OF MARS. THE AMOUNT OF SUNLIGHT REFLECTED BY THE PLANET WAS ALSO MEASURED. THE IRTM WAS A MULTICHANNEL RADIOMETER MOUNTED ON THE ORBITER'S SCAN PLATFORM. FOUR SMALL TELESCOPES, EACH WITH SEVEN INFRARED DETECTORS, WERE AIMED PARALLEL TO THE VISUAL IMAGING OPTICAL AXIS, AND MADE OBSERVATIONS EVERY 1.12 S. THE INSTRUMENT WAS CAPABLE OF MEASURING DIFFERENCES OF 1 C THROUGHOUT A TEMPERATURE RANGE OF -130 C TO +57 C. THE FIELD OF VIEW WAS CIRCULAR, 5 MILLIRADIANS IN DIAMETER.

****

DATA SET NAME- DECALIBRATED INFRARED THERMAL MAPPING DATA ON MAGNETIC TAPE

NSSDC ID- 75-083A-02A

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 08/12/76 TO 10/04/76

QUANTITY OF DATA- 7 REEL(S) OF MAGNETIC TAPE

BRIEF DESCRIPTION
THESE DATA ARE CONTAINED ON 9-TRACK, BINARY, 800-BPI MAGNETIC TAPE SUPPLIED BY THE INVESTIGATION TEAM. THEY CONTAIN THE DECALIBRATED VALUES OF BRIGHTNESS FOR EVERY OBSERVATION AND A VARIETY OF GEOMETRICAL PARAMETERS TO DEFINE THE AREA VIEWED AND THE PERTINENT OBSERVATIONAL PARAMETERS. INCLUDED ARE HEADER RECORDS SPECIFYING THE GEOMETRY OF THE ORBIT AND OF THE SPACECRAFT AT THE TIME OF THE OBSERVATIONAL SEQUENCE, AND DATA RECORDS GIVING THE BRIGHTNESS DATA AND THE GEOMETRIC PARAMETERS PERTAINING TO EACH MEASUREMENT.

****

INVESTIGATION NAME- MARS ATMOSPHERIC WATER DETECTION (MAWD)

NSSDC ID- 75-083A-03

PERSONNEL

TL - C.B.	FARMER	NASA-JPL
TM - D.D.	LAPORTE	SANTA BARBARA RES CTR
TM - D.W.	DAVIES	NASA-JPL

BRIEF DESCRIPTION
THE MAWD USED AN INFRARED GRATING SPECTROMETER MOUNTED ON THE ORBITER SCAN PLATFORM THAT WAS BORESIGHTED WITH THE TELEVISION CAMERAS AND THE IRTM. THE INSTRUMENT MEASURED SOLAR INFRARED RADIATION REFLECTED FROM THE SURFACE THROUGH THE ATMOSPHERE TO THE SPACECRAFT. SPECTRAL INTERVALS WERE SELECTED COINCIDENT WITH THE WAVELENGTH OF WATER VAPOR ABSORPTION LINES IN THE 1.4-MICROMETER BAND. THE QUANTITY OF WATER VAPOR ALONG THE LINE OF SIGHT WAS MEASURED FROM 1 TO 1000 MICROMETERS OF PRECIPITABLE WATER WITH AN ACCURACY OF 5 PERCENT OR BETTER. THE INSTANTANEOUS FIELD OF VIEW OF THE INSTRUMENT WAS 2 X 17 MILLIRADIANS, AND A STEPPING MIRROR ROTATED THE LINE OF SIGHT THROUGH 15 POSITIONS TO PROVIDE A ROUGHLY RECTANGULAR FIELD OF VIEW OF 17 X 31 MILLIRADIANS.

****

DATA SET NAME- MAWD RADIANCE AND GEOMETRY DATA ON TAPE

NSSDC ID- 75-083A-03A

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 07/31/76 TO 06/12/77

QUANTITY OF DATA- 17 REEL(S) OF MAGNETIC TAPE

BRIEF DESCRIPTION
THESE DATA ARE CONTAINED ON 9-TRACK, BINARY, 800-BPI MAGNETIC TAPE SUPPLIED BY THE INVESTIGATION TEAM. THEY CONTAIN THE DECALIBRATED VALUES OF THE INFRARED RADIANCE FROM EACH OBSERVATION AND A VARIETY OF GEOMETRICAL PARAMETERS THAT DEFINE THE AREA VIEWED, AND INCLUDE PERTINENT OBSERVATIONAL PARAMETERS. EACH TAPE RECORD CONTAINS ALL THE DATA FROM ONE COMPLETE RASTER (15 CONSECUTIVE MEASUREMENTS), INCLUDING THE RADIANCES AND THE AREA OF THE SURFACE VIEWED, FOLLOWED BY AVERAGE VALUES FOR THE WHOLE RASTER AS WELL AS PERTINENT GEOMETRICAL AND TIMING INFORMATION.

****

INVESTIGATION NAME- ORBITER RADIO SCIENCE

NSSDC ID- 75-083A-04

PERSONNEL

TL - W.H.	MICHAEL, JR.	NASA-LARC
TM - I.I.	SHAPIRO	MASS INST OF TECH
TM - G.	FJELDBO	NASA-JPL
TM - J.G.	DAVIES	U OF MANCHESTER
TM - D.L.	CAIN	NASA-JPL
TM - M.D.	GROSSI	RAYTHEON CORP
TM - G.S.	TYLER	STANFORD U
TM - J.	BRENKLE	NASA-JPL
TM - R.H.	TOLSON	NASA-LARC
TM - C.T.	STELZRIED	NASA-JPL
TM - G.	BORN	NASA-JPL
TM - R.	REASENBERG	MASS INST OF TECH

BRIEF DESCRIPTION
THERE ARE FOUR DISTINCT SETS OF VIKING RADIO SCIENCE DATA -- THREE USING ORBITER DATA AND ONE PRIMARILY USING LANDER DATA WITH CALIBRATIONS FROM ORBITER DATA. THE ORBITER TRACKING DATA, OBTAINED FROM THE TWO-WAY ORBITER-EARTH S-BAND AND X-BAND RADIO LINKS, CONSIST OF DOPPLER FREQUENCIES AND TIME-OF-FLIGHT RANGE MEASUREMENTS. THESE DETERMINED THE POSITION AND MOTION OF THE ORBITERS, AND CAN BE USED TO STUDY THE MARS GRAVITATIONAL FIELD, THE PLASMA IN INTERPLANETARY SPACE, AND THE STRUCTURE OF THE SOLAR CORONA WHEN THE SPACECRAFT WAS ON THE OPPOSITE SIDE OF THE SUN. THE OCCULTATION DATA WERE OBTAINED FROM THESE SAME RADIO LINKS BY ANALOG RECORDING OF THE SIGNAL WHEN A SPACECRAFT WAS PASSING INTO OR OUT OF OCCULTATION WITH MARS. THE DATA CAN BE USED TO PRODUCE ALTITUDE PROFILES OF THE TEMPERATURE, DENSITY, AND PRESSURE OF THE ATMOSPHERE (INCLUDING THE IONOSPHERE) AND TO MEASURE THE RADIUS OF THE PLANET USING A LARGE NUMBER OF SURFACE POINTS. THE SURFACE PROPERTIES ASPECT OF THIS INVESTIGATION UTILIZED THE UHF (381 MHZ) SIGNAL ON WHICH THE LANDERS TRANSMITTED DATA TO THE ORBITERS. AT THE BEGINNING OR END OF A DATA TRANSMISSION SESSION, WHEN THE ORBITER WAS NEAR THE LANDER'S HORIZON, THE STRENGTH OF THE RECEIVED SIGNAL WAS RECORDED AS A FUNCTION OF TIME. THESE SIGNAL "FADING PATTERNS," RESULTING FROM INTERACTION OF THE RADIO WAVES WITH THE MARTIAN SURFACE, CONTAIN INFORMATION ABOUT THE PHYSICAL PROPERTIES OF THE SURFACE NEAR THE LANDERS. THE LANDER TRACKING DATA FROM THE TWO-WAY DIRECT LANDER-EARTH S-BAND LINKS PERMIT DETERMINATION OF THE LOCATION OF THE LANDERS AND STUDIES OF THE MOTION OF THE PLANET.

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DATA SET NAME- SURFACE ELECTRICAL PROPERTY DATA PLOTS ON MICROFILM

NSSDC ID- 75-083A-04A

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 07/21/76 TO 10/04/76

QUANTITY OF DATA- 1 REEL(S) OF MICROFILM

BRIEF DESCRIPTION
THESE DATA ARE ON 16-MM MICROFILM GENERATED AT NSSDC FROM PAPER PLOTS SUPPLIED BY THE RADIO SCIENCE TEAM. THE PLOTS SHOW AMPLITUDE VS TIME OF LANDER TELEMETRY SIGNALS RECEIVED BY THE ORBITERS. THIS DATA SET INCLUDES ORBITER 1 AND LANDER 1 AND 2 DATA. THERE ARE THREE SECTIONS TO THE DATA: MULTIPATH RESIDUAL DATA FROM LANDER 1 TO ORBITER 1, GAIN AND AXIAL RATIO DATA FROM LANDER 2 TO ORBITER 2, AND GAIN AND AXIAL RATIO DATA FROM LANDER 2 TO ORBITER 1.

****

DATA SET NAME- DECALIBRATED RANGE DATA ON MAGNETIC TAPE

NSSDC ID- 75-083A-04B

AVAILABILITY OF DATA SET- DATA IDENTIFIED BUT NOT RECEIVED

BRIEF DESCRIPTION
THESE DATA, SUPPLIED BY THE RADIO SCIENCE TEAM, ARE ON 7-TRACK, 800-BPI TAPES. FOR THE 'GOOD' RANGE POINTS, WHICH ARE A SUBSET OF THE RANGE POINTS ON THE TRACKING DATA TAPES (SEE 75-083A-04D), THE RESULTS OF AN EXTENSIVE CALIBRATION PROGRAM ARE PRESENTED. THE PARAMETERS LISTED ARE TIME, UNCORRECTED RANGE IN NANOSECONDS, CORRECTION FOR TIME DELAY IN THE SPACECRAFT TRANSPONDER, CORRECTION FOR TIME DELAY IN THE TRACKING STATION EQUIPMENT, CORRECTION FOR THE INTERPLANETARY PLASMA EFFECT (FROM COMPARISON OF S- AND X-BAND DATA), AND FINAL CORRECTED RANGE. THE LATTER SHOULD BE THE BEST OBTAINABLE VALUE OF THE RANGE BETWEEN THE TRACKING STATION ANTENNA AND THE SPACECRAFT ANTENNA.

****

DATA SET NAME- ORBITER RADIO SCIENCE TRACKING DATA ON MAGNETIC TAPE

NSSDC ID- 75-083A-04D

AVAILABILITY OF DATA SET- DATA IDENTIFIED BUT NOT RECEIVED

BRIEF DESCRIPTION
THESE 7-TRACK, 800-BPI MAGNETIC TAPES, SUPPLIED BY THE RADIO SCIENCE TEAM, ARE MERGED AND REFORMATTED VERSIONS OF THE ORIGINAL PROJECT TRACKING TAPES. EACH RECORD CONTAINS ALL OR A SUBSET OF THE FOLLOWING PARAMETERS: TIME, S-BAND DOPPLER FREQUENCY, X-BAND DOPPLER FREQUENCY, S-BAND RANGE AND X-BAND RANGE (LIGHT TIME IN NANOSECONDS), AND CERTAIN TRACKING STATION INFORMATION. SPACING BETWEEN DOPPLER POINTS IS 1 MIN OR LESS AND BETWEEN RANGING POINTS IS FROM 5 TO 20 MIN. FOR ANALYSIS OF THE DOPPLER AND RANGE TRACKING DATA FROM THE ORBITERS, TWO TYPES OF ADDITIONAL DATA ARE REQUIRED: (1) ORBITER STATE VECTORS -- THESE ARE TABULATIONS (USUALLY DAILY) OF THE POSITION AND VELOCITY VECTORS OF THE SPACECRAFT IN VARIOUS COORDINATE SYSTEMS, AND (2) CALENDAR OF ORBITAL MANEUVERS -- THESE ARE CHRONOLOGICAL LISTINGS OF THE TIMES OF ORBITER MANEUVERS. PROPULSIVE MANEUVERS CHANGED THE SPACECRAFT ORBIT DISCONTINUOUSLY. NONPROPULSIVE MANEUVERS, WHICH MERELY REORIENTED THE ORBITER, ARE NEVERTHELESS CLEARLY VISIBLE IN THE DOPPLER DATA. THESE TWO ADDITIONAL TYPES OF SUPPORTING DATA WILL BE INCLUDED WITH ANY REQUEST FOR THESE TAPES.

****

SPACECRAFT COMMON NAME- VIKING 2 LANDER

NSSDC ID- 75-083C

LAUNCH DATE- 09/09/75

PERSONNEL

MG - W.	JAKOBOWSKI	NASA HEADQUARTERS
SC - R.S.	YOUNG	NASA HEADQUARTERS
PM - K.S.	WATKINS	NASA-JPL
PS - C.W.	SNYDER	NASA-JPL

ORIGINAL PAGE IS
OF POOR QUALITY

BRIEF DESCRIPTION
THIS SPACECRAFT WAS THE LANDING VEHICLE FOR THE TWO-PART SPACECRAFT MISSION. IT SOFT-LANDED ON SEPTEMBER 3, 1976, IN THE CYDONIA REGION OF MARS AT 47.67 DEG N LATITUDE AND 225.71 DEG W LONGITUDE. THE LANDER CARRIED INSTRUMENTS TO STUDY THE BIOLOGY, CHEMICAL COMPOSITION (ORGANIC AND INORGANIC), METEOROLOGY, SEISMOLOGY, MAGNETIC PROPERTIES, SURFACE APPEARANCE, AND PHYSICAL PROPERTIES OF THE MARTIAN SURFACE AND ATMOSPHERE. THE LANDER HAD A 70-W POWER CAPACITY AND A SCIENTIFIC PAYLOAD OF APPROXIMATELY 91 KG (200 LB). SOME OF THE DATA COLLECTED WERE RETURNED BY DIRECT RADIO LINK TO EARTH, BUT MOST OF THE DATA WERE RETURNED BY RELAY THROUGH ONE OF THE ORBITERS.

****

INVESTIGATION NAME- PHYSICAL PROPERTIES

NSSDC ID- 75-083C-01

PERSONNEL

TL - R.W.	SHORTHILL	U OF UTAH
TM - R.E.	HUTTON	TRW SYSTEMS GROUP
TM - H.J.	MOORE, II	US GEOLOGICAL SURVEY
TM - R.F.	SCOTT	CALIF INST OF TECH

BRIEF DESCRIPTION
THE PURPOSE OF THE PHYSICAL PROPERTIES INVESTIGATION WAS TO DETERMINE THE PHYSICAL PROPERTIES OF THE MARTIAN SURFACE AND ENVIRONMENT AT THE LANDING SITE, PRIMARILY USING ENGINEERING MEASUREMENTS AND SCIENTIFIC INSTRUMENTS REQUIRED TO MEET OTHER MISSION OBJECTIVES. IN PARTICULAR, IT ATTEMPTED TO DETERMINE SUCH PROPERTIES AS BULK DENSITY, BEARING STRENGTH, ANGLE OF REPOSE, COHESION, ANGLE OF INTERNAL FRICTION, PARTICLE CHARACTERISTICS, THERMAL PARAMETERS, EOLIAN TRANSPORTABILITY, TOPOGRAPHY, AND CERTAIN ENVIRONMENTAL PROPERTIES SUCH AS WIND, TEMPERATURE, AND SOLAR FLUX LEVELS. MAXIMUM USE WAS MADE OF HARDWARE AND INSTRUMENTS INTENDED FOR OTHER APPLICATIONS, SUCH AS THE MECHANICAL SUBSYSTEMS AND LANDER CAMERAS. ONLY PASSIVE DEVICES, SUCH AS MIRRORS AND LANDING LEG STROKE GAGES, WERE ADDED FOR THIS EXPERIMENT.

****

DATA SET NAME- PUBLISHED REPORTS ON THE RESULTS OF THE PHYSICAL PROPERTIES EXPERIMENT

NSSDC ID- 75-083C-01A

AVAILABILITY OF DATA SET- DATA IN PUBLISHED REPORT(S)

QUANTITY OF DATA- 18 PAGE(S) OF UNBOUND HARDCOPY

BRIEF DESCRIPTION
THIS DATA SET CONSISTS OF REPORTS PUBLISHED BY THE INVESTIGATION TEAM THAT DISCUSS THE RESULTS OF THE PHYSICAL PROPERTIES EXPERIMENT. THE REPORTS DISCUSS THE HARDWARE USED, THE RESULTS OF TESTS USING THE SYSTEMS TEST BED, THE RESULTS OF THE IMAGING SCIENCE TESTS, AND THE RESULTS OF THE SCIENCE END-TO-END TESTS. THE APPROXIMATE DATES OF THE TESTS AND THE ELEMENTS TESTED ARE ALSO DISCUSSED. IT IS EMPHASIZED THAT THE RESULTS ARE PRELIMINARY AND, THEREFORE, SUBJECT TO CHANGE.

****

INVESTIGATION NAME- ENTRY SCIENCE ATMOSPHERIC STRUCTURE

NSSDC ID- 75-083C-02

PERSONNEL

TL - A.O.C.NIER		U OF MINNESOTA
TM - A.	SEIFF	NASA-ARC
TM - N.W.	SPENCER	NASA-GSFC

BRIEF DESCRIPTION
THE ENTRY SCIENCE ATMOSPHERIC STRUCTURE EXPERIMENT (ONE OF THREE THAT WERE PART OF THE ENTRY SCIENCE INVESTIGATION) STUDIED THE MARTIAN ATMOSPHERE BELOW AN ALTITUDE OF 132 KM. A VARIETY OF INSTRUMENTS (ACCELEROMETERS, RADAR ALTIMETERS, THERMOMETERS, PRESSURE SENSORS) COLLECTED DATA TO PROVIDE ALTITUDE PROFILES OF PRESSURE AND TEMPERATURE OF THE ATMOSPHERE AND ACCELERATION OF THE LANDER CAPSULE. FROM THESE DATA, ATMOSPHERIC DENSITY AND MEAN ATOMIC MASS CAN BE CALCULATED.

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DATA SET NAME- TABULATIONS OF ENTRY MEASUREMENTS FOR ATMOSPHERIC STRUCTURE ON MICROFICHE

NSSDC ID- 75-083C-02A

AVAILABILITY OF DATA SET- DATA IDENTIFIED BUT NOT RECEIVED

BRIEF DESCRIPTION
THIS DATA SET, SUPPLIED BY THE INVESTIGATION TEAM, IS ON B/W MICROFICHE, AND CONTAINS TABULATIONS OF VARIOUS PARAMETERS AS FUNCTIONS OF TIME, COVERING TWO PHASES OF THE DESCENTS: (1) FROM 132 KM TO 6 KM IN ALTITUDE WITH THE LANDERS IN THEIR AEROSHELLS AND (2) FROM 6 KM TO 1.5 KM ON PARACHUTES. THE PARAMETERS LISTED FOR BOTH LANDERS ARE ACCELERATION ALONG TWO AXES, ALTITUDE MEASURED BY THE ALTIMETER, VELOCITY (MAGNITUDE AND PATH ANGLE), PRESSURE, AND TEMPERATURE.

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INVESTIGATION NAME- BIOLOGY

NSSDC ID- 75-083C-03

PERSONNEL

TL - H.P.	KLEIN	NASA-ARC
TM - J.	LEDERBERG	STANFORD U
TM - A.	RICH	MASS INST OF TECH
TM - N.H.	HOROWITZ	CALIF INST OF TECH
TM - V.I.	OYAMA	NASA-ARC
TM - G.V.	LEVIN	BIOSPHERICS, INC

BRIEF DESCRIPTION
THE BIOLOGY EXPERIMENT SEARCHED FOR THE PRESENCE OF MARTIAN ORGANISMS BY LOOKING FOR METABOLIC PRODUCTS. THREE DISTINCT INSTRUMENTS (PYROLYTIC RELEASE (PR), LABELED RELEASE (LR), AND GAS EXCHANGE (GEX)) INCUBATED SAMPLES OF THE MARTIAN SURFACE UNDER A NUMBER OF DIFFERENT ENVIRONMENTAL CONDITIONS. IN SOME INSTANCES A SAMPLE WAS HEAT STERILIZED AND REPROCESSED AS A CONTROL. THE PR, OR CARBON ASSIMILATION, INSTRUMENT SOUGHT TO DETECT THE PHOTOSYNTHETIC OR CHEMICAL FIXATION OF CO2 OR CO CONTAINING C-14. THE SAMPLES WERE INCUBATED FOR SEVERAL DAYS IN THE PRESENCE OF THE RADIOACTIVE GAS MIXTURE, SOME SAMPLES WITH SIMULATED SUNLIGHT AND SOME WITHOUT. NEXT, EACH SAMPLE WAS HEATED TO 120 C TO REMOVE UNREACTED CO2 AND CO. THE SOIL WAS PYROLIZED AT 650 C AND ANY ORGANIC PRODUCTS WERE COLLECTED IN AN ORGANIC VAPOR TRAP (OVT). FINALLY, THE TRAP WAS HEATED TO COMBUST THE ORGANIC MATERIAL TO CO2 AND ANY EVOLVED RADIOACTIVE GAS WAS MEASURED. THE LR EXPERIMENT SOUGHT TO DETECT METABOLIC PROCESSES THROUGH RADIORESPIROMETRY. LIQUID NUTRIENTS LABELED WITH RADIOACTIVE CARBON WERE ADDED TO THE SAMPLES AND THE ATMOSPHERE ABOVE WAS CONTINUOUSLY MONITORED TO DETECT ANY RADIOACTIVE GASES RELEASED FROM THESE NONVOLATILE NUTRIENTS. THE GEX MEASURED THE PRODUCTION AND/OR UPTAKE OF CO2, N2, CH4, H2, AND O2 DURING INCUBATION OF A SOIL SAMPLE. THE SAMPLE WAS SEALED AND PURGED BY HE, THEN A MIXTURE OF HE, KR, AND CO2 WAS INTRODUCED AS AN INITIAL INCUBATION ATMOSPHERE. AFTER THE ADDITION OF A SELECTED QUANTITY OF A NUTRIENT SOLUTION (SATURATED WITH THE DIAGNOSTIC GAS, NEON), THE SAMPLE WAS INCUBATED. AT CERTAIN INTERVALS, SAMPLES OF THE ATMOSPHERE WERE REMOVED AND ANALYZED BY A GAS CHROMATOGRAPH WITH A THERMAL CONDUCTIVITY DETECTOR.

****

DATA SET NAME- GAS EXCHANGE, LABELED RELEASE, AND PYROLYTIC RELEASE DATA ON MICROFILM

NSSDC ID- 75-083C-03F

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 09/04/76 TO 05/29/77

QUANTITY OF DATA- 11 REEL(S) OF MICROFILM

BRIEF DESCRIPTION
THESE DATA, SUPPLIED BY THE INVESTIGATION TEAM, ARE ON 16-MM MICROFILM AND CONSIST OF DESCRIPTIONS OF THE COMMANDS THAT WERE SENT TO OPERATE THE THREE INSTRUMENTS AND TABULATIONS OF RAW AND REDUCED DATA RETURNED. THE COMMAND DATA INCLUDE: MARS TIME FOR EACH EXPERIMENT SEQUENCE, THE COMMANDS SENT, PREDICTED DATA POINTS FOR EACH COMMAND FILE THAT WERE USED TO TIME TAG THE DATA WHEN IT CAME BACK FROM THE INSTRUMENT, AND A SUMMARY OF THE MAJOR EVENTS OF EACH COMMAND SEQUENCE. THESE COMMAND DATA ARE IDENTIFIED AS BIOLOGY/C. THE TABULATION/PLOT DATA INCLUDE INSTRUMENT RESPONSE, TIME-TAGGED, ENGINEERING, AND SUMMARY PLOT DATA. THE INSTRUMENT RESPONSE DATA CONSIST OF RAW RETURN DOWNLINK DATA IN OCTAL FORM, THE SAME DATA AFTER BASIC REDUCTION, AND THE TIME-TAGGED DATA IN VALUE POINT FORM. THE TIME-TAGGED DATA ARE THE PRIMARY REDUCED FORM OF THE DATA. THESE DATA ARE MARS MISSION TIME (MMT) OF THE DATA POINT, LOCAL LANDER TIME (LLT), TYPE OF MEASUREMENT, THE VALUE OF THE DATA POINT, AND DIAGNOSTIC INFORMATION ABOUT EACH DATA POINT. ENGINEERING DATA ARE INCLUDED AFTER THE RAW AND REDUCED DATA. THE FOURTH PART OF THE DATA IS PLOTS THAT SUMMARIZE THE DATA. THE REDUCED DATA FOR THE BIOLOGY INSTRUMENT ARE GEX CHROMATOGRAM VOLTAGES, GEX NANOMOLES VS TIME PLOTS, PR RADIOACTIVITY VS TIME, LR COUNTS/MIN SUMMARY, AND TIME-TAGGED INSTRUMENT VALUES.

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INVESTIGATION NAME- MOLECULAR ANALYSIS

NSSDC ID- 75-083C-04

PERSONNEL

TL - K.	BIEMANN	MASS INST OF TECH
TM - H.C.	UREY	U OF CALIF, SAN DIEGO
TM - D.M.	ANDERSON	USA-CRREL
TM - T.	OWEN	STATE U OF NEW YORK
TM - J.	ORO	U OF HOUSTON
TM - L.E.	ORGEL	SALK INST BIOL STUDIES
TM - A.O.C.NIER		U OF MINNESOTA
TM - P.	TOULMIN, 3RD	US GEOLOGICAL SURVEY

BRIEF DESCRIPTION
THE MOLECULAR ANALYSIS EXPERIMENT SEARCHED FOR CHEMICAL COMPOUNDS IN THE UPPER SURFACE LAYER OF MARS AND MEASURED ATMOSPHERIC COMPOSITION NEAR THE SURFACE. THE SOIL ANALYSES WERE PERFORMED USING A GAS CHROMATOGRAPH MASS SPECTROMETER (GCMS) THAT HAD HIGH SENSITIVITY, HIGH STRUCTURAL SPECIFICITY, AND BROAD APPLICABILITY TO A WIDE RANGE OF COMPOUNDS. SUBSTANCES WERE VAPORIZED FROM THE SURFACE MATERIAL BY A HEATING PROCESS WHILE CO2 (LABELED WITH C-13) SWEPT THROUGH. THE MATERIAL WAS THEN CARRIED INTO A TENEX GAS-CHROMATOGRAPHIC COLUMN THAT WAS SWEPT WITH HYDROGEN AS A CARRIER GAS. WHILE PASSING THROUGH THE COLUMN, SUBSTANCES WERE SEPARATED BY DIFFERENT DEGREES OF RETENTION. THE RESIDUAL STREAM MOVED INTO THE MASS SPECTROMETER (AFTER HYDROGEN WAS REMOVED BY HYDROGEN-ONLY-PERMEABLE PALLADIUM, AND A MASS SPECTRUM (MASSES FROM 12 TO 200 U) WAS OBTAINED EVERY 10 S FOR THE 84 MIN OF THE GAS CHROMATOGRAM. IN SOME CASES, THE SAME SAMPLE WAS REHEATED AT A HIGHER TEMPERATURE AND ANALYZED TO DETECT LESS VOLATILE MATERIALS. FOR ATMOSPHERIC MEASUREMENTS, GASES WERE DIRECTLY INTRODUCED INTO THE MASS SPECTROMETER, BYPASSING THE GAS CHROMATOGRAPH COLUMN.

****

DATA SET NAME- GAS CHROMATOGRAPH MASS SPECTROMETER SOIL ANALYSIS DATA ON MAGNETIC TAPE

NSSDC ID- 75-083C-04A

AVAILABILITY OF DATA SET- DATA IDENTIFIED BUT NOT RECEIVED

BRIEF DESCRIPTION
THESE DATA, ON 9-TRACK, 800-BPI, UNLABELED, IBM-COMPATIBLE TAPES, ARE IN RAW FORM, JUST AS THEY WERE RECEIVED BY THE VIKING EXPERIMENTERS FROM THE TELEMETRY DECOMMUTATION PROGRAM OUTPUT, EXCEPT THAT THEY HAVE BEEN PUT INTO LOGICAL ORDER AND GAPS HAVE BEEN FILLED IN. THEY ARE UNLIKELY TO BE USABLE BY ANYONE NOT VERY FAMILIAR WITH THE MISSION OPERATIONS AND THE INSTRUMENT DESIGN. EACH SAMPLE RUN, COMPRISING ONE FILE ON THE TAPE, INCLUDES SEVERAL SPECTRAL SCANS DIVIDED ARBITRARILY INTO SMALL BLOCKS. THE QUANTITIES LISTED ARE THE OUTPUT OF THE ANALOG-TO-DIGITAL CONVERTER ON A LOGARITHMIC SCALE AS A FUNCTION OF TIME. SEPARATE BLOCKS OF ENGINEERING DATA CONTAIN TEMPERATURES, PRESSURES, AND OTHER INSTRUMENT PARAMETERS.

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DATA SET NAME- SOIL ANALYSIS MASS SPECTRA ON MAGNETIC TAPE

NSSDC ID- 75-083C-04B

AVAILABILITY OF DATA SET- DATA IDENTIFIED BUT NOT RECEIVED

BRIEF DESCRIPTION
THE SPECTRAL DATA, ON 9-TRACK, 800-BPI TAPES, ARE REDUCED VERSIONS OF THE GCMS SOIL ANALYSIS DATA (75-083C-04A). EACH SAMPLE RUN IS ON A SEPARATE FILE, AND THERE IS ONE RECORD FOR EACH SPECTRAL SCAN, INCLUDING MASS SPECTRUM DATA AND ENGINEERING DATA. LISTED IS THE INTENSITY IN ARBITRARY LINEAR UNITS AS A FUNCTION OF MASS NUMBER FROM 12 TO 215 IN THE CONVENTIONAL MASS SPECTRUM FORMAT. THE ENGINEERING INFORMATION INCLUDED PERMITS CONVERSION OF INTENSITIES TO CURRENT UNITS.

****

DATA SET NAME- SOIL ANALYSIS MASS SPECTRA ON MICROFILM

NSSDC ID- 75-083C-04C

AVAILABILITY OF DATA SET- DATA IDENTIFIED BUT NOT RECEIVED

BRIEF DESCRIPTION
THE SAME DATA AS ON THE MASS SPECTRA TAPES ARE PRESENTED AS BAR GRAPHS ON 16-MM MICROFILM. EACH FRAME CONTAINS ONE COMPLETE GRAPH OF THE INTENSITIES OF ALL MASSES DETECTED. BECAUSE THE LOWER MASSES (MOSTLY CO2 AND H2O) ARE PREDOMINANT, A SECOND GRAPH STARTING AT ABOUT MASS 45 SHOWS THE HEAVY ELEMENTS AT A MORE APPROPRIATE SCALE. GRAPHS OF ENGINEERING PARAMETERS ARE ALSO INCLUDED.

****

DATA SET NAME- GCMS ATMOSPHERIC ANALYSIS DATA ON MAGNETIC TAPE

NSSDC ID- 75-083C-04D

AVAILABILITY OF DATA SET- DATA IDENTIFIED BUT NOT RECEIVED

BRIEF DESCRIPTION
THESE DATA, ON 9-TRACK, 800-BPI TAPE, ARE THE GCMS RAW DATA FOR THE ATMOSPHERIC ANALYSES. FOR THE VIKING 1 PRIMARY MISSION THERE WERE 4 FILTERED ATMOSPHERIC SAMPLES WITH CO AND CO2 REMOVED, 12 UNFILTERED SAMPLES, AND 3 SAMPLES AFTER 10 ENRICHMENT CYCLES TO INCREASE THE CONCENTRATION OF TRACE ELEMENTS. FOR THE VIKING 2 PRIMARY MISSION THERE WERE 4 FILTERED ATMOSPHERIC SAMPLES WITH CO AND CO2 REMOVED, 2 UNFILTERED SAMPLES, 1 SAMPLE AFTER 5 ENRICHMENT CYCLES, 2 SAMPLES AFTER 10 ENRICHMENT CYCLES, AND 6 SAMPLES AFTER 15 ENRICHMENT CYCLES. THESE TAPES CONTAIN DATA IN RAW FORM SIMILAR TO THAT ON THE SOIL ANALYSIS FLIGHT DATA TAPES, BUT THE DATA QUANTITY IS MUCH LESS. THE PARAMETERS ARE MASS SPECTROMETER ELECTRON MULTIPLIER OUTPUT AS A FUNCTION OF TIME FOR EACH MEASUREMENT SCAN AND THE ASSOCIATED BACKGROUND SCAN.

****

INVESTIGATION NAME- LANDER IMAGING

NSSDC ID- 75-083C-06

PERSONNEL

TL - T.A.	MUTCH	BROWN U
TM - C.	SAGAN	CORNELL U
TM - A.B.	BINDER	SCIENCE APPL, INC
TM - E.C.	MORRIS	US GEOLOGICAL SURVEY
TM - F.O.	HUCK	NASA-LARC
TM - E.C.	LEVINTHAL	STANFORD U
TM - S.	LIEBES, JR.	STANFORD U
TM - J.B.	POLLACK	NASA-ARC

BRIEF DESCRIPTION
THE LANDER IMAGING EXPERIMENT VIEWED THE SCENE SURROUNDING THE LANDER, THE SURFACE SAMPLER AND OTHER PARTS OF THE LANDER, THE SUN, AND PHOBOS TO PROVIDE DATA FOR OPERATIONAL PURPOSES AND FOR GEOLOGICAL AND METEOROLOGICAL INVESTIGATIONS. TWO SCANNING CAMERAS, CAPABLE OF RESOLVING 0.04 DEG (HIGH RESOLUTION) OR 0.12 DEG (LOW RESOLUTION, COLOR, AND IR) WERE USED ON EACH LANDER. EACH IMAGE ACQUIRED COVERED A VERTICAL FIELD OF 20 DEG (HIGH RESOLUTION) OR 60 DEG (LOW RESOLUTION, COLOR, AND IR) AND A HORIZONTAL FIELD THAT WAS COMMANDABLE FROM 2.5 DEG TO 342.5 DEG IN 2.5-DEG INCREMENTS. IMAGES WERE ACQUIRED FROM 40 DEG ABOVE THE NOMINAL HORIZON TO 60 DEG BELOW, AND WERE COMMANDABLE IN 10-DEG INCREMENTS. THE CAMERAS WERE MOUNTED 1.3 M ABOVE THE NOMINAL LANDING PLANE AND WERE CAPABLE OF VIEWING TWO FOOTPADS AND MOST OF THE AREA ACCESSIBLE TO THE SURFACE SAMPLER. THE TWO CAMERAS WERE SEPARATED BY 0.8 M, AND STEREOSCOPIC PICTURES WERE OBTAINED OVER MOST OF THE SCENE. BLACK AND WHITE IMAGES IN EITHER LOW OR HIGH RESOLUTION INCLUDED RADIATION WAVELENGTHS FROM 0.4 TO 1.1 MICROMETERS. THE USE OF A SINGLE DETECTOR TO IMAGE AN ENTIRE FRAME ALLOWED A RELATIVE RADIOMETRIC ACCURACY OF PLUS OR MINUS 10 PERCENT. FOR MORE INFORMATION CONCERNING THE CAMERAS, SEE HUCK ET AL., SPACE SCIENCE INSTRUMENTATION 1, 189-241 (1975).

****

DATA SET NAME- B/W PRESS RELEASE PHOTOGRAPHY

NSSDC ID- 75-083C-06A

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 09/03/76 TO 02/22/77

QUANTITY OF DATA- 13 FRAMES

BRIEF DESCRIPTION
THESE DATA ARE ON 4- X 5-IN. B/W NEGATIVES RELEASED BY THE PROJECT FOR PUBLIC DISTRIBUTION. THESE PHOTOGRAPHS ARE OF SELECTED SCENES NEAR THE LANDER THAT ARE OF GENERAL INTEREST TO THE PUBLIC. A DESCRIPTION OF EACH PHOTOGRAPH IS INCLUDED.

****

DATA SET NAME- COLOR PRESS RELEASE PHOTOGRAPHY

NSSDC ID- 75-083C-06B

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 11/26/76 TO 01/17/77

QUANTITY OF DATA- 2 FRAMES

BRIEF DESCRIPTION
THESE DATA ARE ON 4- X 5-IN. COLOR FILM RELEASED BY THE PROJECT FOR PUBLIC DISTRIBUTION. THESE PHOTOGRAPHS ARE OF SELECTED SCENES NEAR THE LANDER THAT ARE OF GENERAL INTEREST TO THE PUBLIC. A DESCRIPTION OF EACH PHOTOGRAPH IS INCLUDED. THE COLORING CANNOT BE CONSIDERED TO BE ACCURATE BECAUSE OF COLOR INACCURACIES IN REPRODUCTION.

****

DATA SET NAME- EXPERIMENT DATA RECORD (EDR) B/W IMAGES ON FILM

NSSDC ID- 75-083C-06D

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 09/03/76 TO 11/05/76

QUANTITY OF DATA- 1128 FRAMES

BRIEF DESCRIPTION
THIS DATA SET, SUPPLIED BY THE LANDER IMAGING TEAM, CONSISTS OF THE B/W EDR VERSION OF THE LANDER PHOTOGRAPHY. THE DATA BLOCK ON EACH FRAME CONTAINS IDENTIFICATION, PROCESSING, AND CAMERA EVENT INFORMATION. THE DATA ARE AVAILABLE ON 5-IN. ROLL FILM OR AS INDIVIDUAL 5- X 5-IN. FRAMES AND MAY BE ORDERED WITH OR WITHOUT THE DATA BLOCK. THIS TOTAL DATA SET IS A COMPLETE RECORD OF THE LANDER IMAGING DATA AS RECEIVED ON EARTH. THE PICTURE CATALOG OF PRIMARY MISSION EDR

ORIGINAL PAGE IS
OF POOR QUALITY

(75-083C-06E) SHOULD BE USED TO ORDER EDR IMAGES.

****

DATA SET NAME- PICTURE CATALOG OF PRIMARY MISSION EXPERIMENT DATA RECORD (EDR)

NSSDC ID- 75-083C-06E

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

QUANTITY OF DATA- 6 CARD(S) OF B/W MICROFICHE

BRIEF DESCRIPTION
THESE DATA ARE ON B/W MICROFICHE GENERATED AT NSSDC FROM NASA REFERENCE PUBLICATION 1007 PREPARED BY ROBERT B. TUCKER. THIS PUBLICATION IS A GENERAL REFERENCE FOR THE IMAGING DATA FROM THE VIKING LANDER PRIMARY MISSION. IT PRESENTS THE RESULTS OF THE PROCEDURES THAT WERE APPLIED TO THE IMAGING DATA TO PRODUCE AN ORGANIZED RECORD THAT IS AS COMPLETE AND AS ERROR-FREE AS POSSIBLE. THE RESULT IS CALLED THE EXPERIMENT DATA RECORD. THIS PUBLICATION CONTAINS ALL IMAGES RETURNED BY THE TWO VIKING LANDERS DURING THE PRIMARY MISSION. SKYLINE DRAWINGS DISPLAY THE OUTLINES OF THE IMAGES AS THEY APPEAR IN THE VIEWING AREA. ALSO INCLUDED ARE A SELECTION OF COMPUTER-GENERATED CAMERA EVENT REPORTS THAT LIST SUPPLEMENTAL INFORMATION ABOUT THE CONDITIONS UNDER WHICH THE DATA WERE COLLECTED AND HOW THEY WERE PROCESSED AND RECORDED. IN ADDITION TO A COMPREHENSIVE REPORT, SEVERAL LISTINGS ARE INCLUDED THAT GROUP THE IMAGES IN A VARIETY OF WAYS (E.G., BY TIME OF DAY). A SECTION ON TERMINOLOGY HAS BEEN INCLUDED TO ASSIST WITH THE INTERPRETATION OF THE LISTINGS AND THE IMAGE PRESENTATION. SEVERAL DIAGRAMS ALSO PROVIDE ASSISTANCE ON THIS SUBJECT. THIS PUBLICATION WILL ACQUAINT THE USER WITH THE IMAGING DATA THAT ARE AVAILABLE FROM THE VIKING LANDER PRIMARY MISSION AND THE PROCEDURE USED TO OBTAIN PHOTOGRAPHIC PRODUCTS. IT IS NECESSARY TO ORDER THIS DATA SET TO SELECT EDR IMAGES (75-083C-06D).

****

DATA SET NAME- TEAM DATA RECORD (TDR) B/W IMAGES ON FILM

NSSDC ID- 75-083C-06C

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 09/03/76 TO 06/07/77

QUANTITY OF DATA- 879 FRAMES

BRIEF DESCRIPTION
THESE DATA, SUPPLIED BY THE LANDER IMAGING TEAM, ARE ON 5- X 12-IN. B/W FILM. TDR DATA CONSIST OF THOSE CAMERA EVENTS (CE) FROM THE EDR THOUGHT TO BE OF MOST GENERAL INTEREST. IT EXCLUDES SUCH THINGS AS SPECIALIZED PHOTOMETRIC SERIES, CALIBRATION AND SCAN VERIFICATION EVENTS, AND SOLAR IMAGES. THE PROCESSING PARAMETERS FOR THE CAMERA EVENTS IN THE TDR WERE CHOSEN TO CREATE PHOTOGRAPHIC PRODUCTS OF THE HIGHEST SCIENTIFIC QUALITY. EACH FRAME IS DIVIDED INTO SEGMENTS, WITH THE DATA BLOCK APPEARING ON THE LAST SEGMENT OF THE CAMERA EVENT. THE TDR AND EDR CE LABELS ARE IDENTICAL. THE TDR VERSION WILL BE SUPPLIED FOR REQUESTS UNLESS EDR IS SPECIFIED. THE TDR-IPL PRIME MISSION CATALOG (75-083C-06K) SHOULD BE USED TO ORDER TDR IMAGES.

****

DATA SET NAME- TEAM DATA RECORD (TDR) COLOR IMAGES ON FILM

NSSDC ID- 75-083C-06F

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 09/05/76 TO 11/05/76

QUANTITY OF DATA- 47 FRAMES

BRIEF DESCRIPTION
THIS DATA SET, SUPPLIED BY THE LANDER IMAGING TEAM, CONSISTS OF 5- X 12-IN. COLOR IMAGES SELECTED FROM THE TDR IMAGES. THERE ARE GENERALLY TWO VERSIONS OF EACH SCENE. THE TWO VERSIONS REPRESENT THE COLORS AS SEEN ON MARS UNDER MARS LIGHTING CONDITIONS AND AS SEEN ON EARTH UNDER EARTH LIGHTING CONDITIONS. INCLUDED ON EACH FRAME ARE GRAY SCALE WEDGES, DATA BLOCKS, AND COLOR SPECTRUM HISTOGRAMS. OCCASIONALLY, A THIRD TYPE IS GIVEN IN WHICH THE COLOR IS AS ON MARS BUT WAS MADE FROM PRODUCTS THAT DID NOT HAVE THE FULL SIX-CHANNEL DATA ACQUIRED. THIS TYPE IS CALLED 'RADCAM'. THE TDR-IPL PRIME MISSION CATALOG (75-083C-06K) SHOULD BE USED TO ORDER TDR IMAGES. THE COLORING CANNOT BE CONSIDERED TO BE ACCURATE BECAUSE OF COLOR INACCURACIES IN REPRODUCTION.

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DATA SET NAME- TDR-IPL PRIME MISSION CATALOG ON MICROFICHE

NSSDC ID- 75-083C-06K

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

QUANTITY OF DATA- 3 CARD(S) OF B/W MICROFICHE

BRIEF DESCRIPTION
THIS DATA SET, SUPPLIED BY THE LANDER IMAGING TEAM, IS ON B/W MICROFICHE. THE NECESSARY ORDERING INFORMATION IS CAMERA EVENT (CE) LABEL, VERSION, SEGMENT, AND IPL PIC ID. ENGINEERING PARAMETERS ARE ALSO INCLUDED. AN ASTERISK WITH THE CE LABEL INDICATES THE AVAILABILITY OF A COLOR IMAGE. IT IS NECESSARY TO ORDER THIS DATA SET TO SELECT TDR IMAGES (75-083C-06C AND -06F).

****

DATA SET NAME- HIGH-RESOLUTION B/W MOSAICS

NSSDC ID- 75-083C-06H

AVAILABILITY OF DATA SET- DATA IDENTIFIED BUT NOT RECEIVED

BRIEF DESCRIPTION
THIS DATA SET, SUPPLIED BY THE LANDER IMAGING TEAM, CONSISTS OF COMPUTER-GENERATED HIGH-RESOLUTION MOSAICS ON 8- X 10-IN. B/W NEGATIVES. THREE SETS OF MOSAICS WERE PRODUCED: ONE SET FOR IMAGES ACQUIRED EARLY IN THE MORNING, ONE SET FOR IMAGES ACQUIRED AROUND NOON, AND ONE SET FOR IMAGES ACQUIRED IN THE EARLY EVENING. THE COMPLETE MOSAICKED SCENE EXTENDS 342.5 DEG IN AZIMUTH. THE IMAGE AREA EXTENDS FROM APPROXIMATELY 5 DEG ABOVE THE HORIZON TO 60 DEG BELOW. THE MOSAIC NEGATIVES HAVE BEEN MADE IN TWO FORMS. IN ONE CASE, USING A 25-MICROMETER SPOT SIZE, THE COMPLETE FOUR QUADRANTS OF A SINGLE MOSAIC ARE CONTAINED ON A SINGLE 8- X 10-IN. NEGATIVE. IN THE SECOND CASE, THREE PRODUCTS ARE MADE USING A 100-MICROMETER SPOT SIZE. THEY COVER QUADRANTS 1 AND 2, 2 AND 3, AND 3 AND 4 ON EACH OF THREE 8- X 10-IN. NEGATIVES. THE QUADRANT AZIMUTH LIMITS ARE AS FOLLOWS: QUADRANT 1 IS 0 TO 90 DEG, QUADRANT 2 IS 84 TO 174 DEG, QUADRANT 3 IS 168 TO 258 DEG, AND QUADRANT 4 IS 252 TO 342 DEG.

****

DATA SET NAME- DONUT PROJECTION IMAGES ON FILM

NSSDC ID- 75-083C-06I

AVAILABILITY OF DATA SET- DATA IDENTIFIED BUT NOT RECEIVED

BRIEF DESCRIPTION
THIS DATA SET, SUPPLIED BY THE LANDER IMAGING TEAM, CONSISTS OF 8- X 10-IN. B/W NEGATIVES OF COMPUTER-GENERATED PANORAMAS PRODUCED TO SHOW A 360-DEG FISHEYE-TYPE IMAGE OF THE MARTIAN TERRAIN WITH THE CAMERA IN THE CENTER OF THE IMAGE. THIS PRODUCES A 'HOLE' WHERE THE CAMERAS COULD NOT SCAN AND HENCE THE NAME 'DONUT'. THEY ARE USEFUL PRIMARILY FOR SHOWING THE LOCATIONS OF FEATURES RELATIVE TO THE LANDERS. EACH DONUT IMAGE WAS CREATED USING A HIGH-RESOLUTION MOSAIC FROM DATA SET 75-083C-06H. THESE MOSAICS WERE SUB-SAMPLED BY A FACTOR OF THREE, REDUCING THE RESOLUTION, TO CONSERVE COMPUTER PROCESSING TIME. THE DONUT IMAGES WERE GENERATED FOR THE SAME TIME PERIODS AS THE MOSAICS.

****

INVESTIGATION NAME- METEOROLOGY

NSSDC ID- 75-083C-07

PERSONNEL

TL - S.L.	HESS	FLORIDA STATE U
TM - C.B.	LEOVY	U OF WASHINGTON
TM - R.M.	HENRY	NASA-LARC
TM - J.A.	RYAN	MCDONNELL-DOUGLAS CORP
TM - J.E.	TILLMAN	U OF WASHINGTON

BRIEF DESCRIPTION
THIS EXPERIMENT ANALYZED THE METEOROLOGICAL ENVIRONMENT NEAR THE PLANETARY SURFACE AND OBTAINED INFORMATION ABOUT MOTION SYSTEMS OF VARIOUS SCALES. THE ATMOSPHERIC PARAMETERS DETERMINED WERE PRESSURE, TEMPERATURE, WIND SPEED, AND WIND DIRECTION. DIURNAL AND SEASONAL VARIATIONS WERE OF PARTICULAR IMPORTANCE. THE SAMPLING RATES AND DURATIONS FOR ANY ONE MARTIAN DAY WERE SELECTABLE BY GROUND COMMAND. THE SENSORS WERE MOUNTED ON AN ERECTABLE BOOM. THREE HOT-FILM ANEMOMETERS, THROUGH WHICH AN ELECTRIC CURRENT WAS PASSED TO HEAT TWO GLASS NEEDLES COATED WITH PLATINUM AND OVERCOATED WITH ALUMINUM OXIDE, WERE USED TO MEASURE WIND SPEED. THE ELECTRIC POWER NEEDED TO MAINTAIN THESE SENSORS AT A FIXED TEMPERATURE ABOVE THE SURROUNDING AIR WAS THE MEASURE OF WIND SPEED. ATMOSPHERIC TEMPERATURE WAS MEASURED BY THREE FINE-WIRE THERMOCOUPLES IN PARALLEL. A THIN METAL DIAPHRAGM, MOUNTED IN A VACUUM SEALED CASE, WAS USED TO MEASURE ATMOSPHERIC PRESSURE.

****

DATA SET NAME- SANMET LISTINGS OF TEMPERATURE AND VECTOR WIND VS TIME ON MICROFICHE

NSSDC ID- 75-083C-07A

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 11/17/76 TO 02/11/78

QUANTITY OF DATA- 583 CARD(S) OF B/W MICROFICHE

BRIEF DESCRIPTION
THIS DATA SET, ON B/W MICROFICHE CONSISTS OF A COPY OF THE COMPUTER PRINTOUT OF THE SCIENCE ANALYSIS OF METEOROLOGY (SANMET) PROGRAM, WHICH PRESENTS ALL THE INFORMATION ABOUT EVERY MEASUREMENT THAT WAS AVAILABLE TO THE VIKING METEOROLOGY SCIENCE TEAM. RAW DATA (INSTRUMENT VOLTAGE READINGS), REDUCED DATA, AND STATISTICAL SUMMARIES ARE INCLUDED. MUCH OF THE INFORMATION IS REDUNDANT OR OF NO VALUE TO THE USER. FOR EACH MARS DAY THERE ARE FOUR SETS OF DATA LISTINGS: (1) INSTRUMENT VOLTAGE OUTPUTS (RAW DATA); (2) CALCULATED VOLTAGE, RESISTANCE, AND TEMPERATURE VALUES; (3) WIND AND TEMPERATURE DATA IN GEOPHYSICAL UNITS; AND (4) PRESSURE DATA IN GEOPHYSICAL UNITS. THERE IS ALSO INFORMATION ON THE DATA BASE INPUT THAT CONTROLLED THE SANMET RUN AND ON PARITY ERRORS IN THE DATA. THE REDUCED DATA (ITEMS 3 AND 4) WERE USED TO PREPARE THE ABRIDGED DATA SETS -07B AND -07C.

****

DATA SET NAME- HIGH TIME RESOLUTION PLOTS OF VECTOR WIND AND TEMPERATURE VS TIME (SECONDS)

NSSDC ID- 75-083C-07B

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 09/03/76 TO 11/03/76

QUANTITY OF DATA- 5 REEL(S) OF MICROFILM

BRIEF DESCRIPTION
THIS 16-MM MICROFILM DATA SET WAS GENERATED AT NSSDC FROM HARDCOPY REDUCED DATA PLOTS PREPARED BY THE EXPERIMENTER. THE DATA CONSIST OF PLOTS OF THREE PARAMETERS (WIND SPEED, WIND DIRECTION, AND TEMPERATURE) VS TIME (MARS SECONDS) ELAPSED SINCE THE BEGINNING OF THE MEASUREMENT. SUCH INFORMATION AS EARTH START AND STOP TIMES OF THE OBSERVATION IS PRINTED AT THE TOP OF EACH FRAME. NORMALLY THERE IS ONE 5-MIN OBSERVING PERIOD FOR EACH MARS HOUR, EXCEPT THAT THE FIRST OBSERVING PERIOD EACH DAY IS FOR 10 MIN. EACH PLOT DISPLAYS RELATIVELY FINE TIME SCALE DATA TAKEN FOR ONE OF THE HOURLY OBSERVATION PERIODS.

****

DATA SET NAME- LOW TIME RESOLUTION (AVERAGE) PLOTS OF VECTOR WIND, AND TEMPERATURE VS TIME (HRS)

NSSDC ID- 75-083C-07C

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 09/03/76 TO 11/03/76

QUANTITY OF DATA- 2 REEL(S) OF MICROFILM

BRIEF DESCRIPTION
THIS 16-MM MICROFILM DATA SET WAS GENERATED AT NSSDC FROM HARDCOPY ANALYZED DATA PREPARED BY THE EXPERIMENTER FROM THE REDUCED DATA IN DATA SET 75-083C-07B. THE DATA CONSIST OF SERIES OF THREE FILM FRAMES, ONE FRAME EACH FOR WIND SPEED, WIND DIRECTION, AND TEMPERATURE. EACH PLOTTED POINT IS OBTAINED BY AVERAGING ALL OBSERVATIONS TAKEN DURING ONE MARS HOUR (MODULE). EACH PLOT DEPICTS DAILY PARAMETER VARIATIONS FOR A PARTICULAR DAY.

****

INVESTIGATION NAME- SEISMOLOGY

NSSDC ID- 75-083C-08

PERSONNEL

TL - D.L.	ANDERSON	CALIF INST OF TECH
TM - M.N.	TOKSOZ	MASS INST OF TECH
TM - G.H.	SUTTON	U OF HAWAII
TM - R.L.	KOVACH	STANFORD U
TM - G.V.	LATHAM	U OF TEXAS, GALVESTON
TM - F.	DUENNEBIER	U OF HAWAII

BRIEF DESCRIPTION
THE SEISMOLOGY EXPERIMENT WAS DESIGNED TO DETERMINE THE LEVEL OF SEISMIC ACTIVITY ON MARS AND ITS INTERNAL STRUCTURE. THE SEISMOLOGY INSTRUMENT CONTAINED THREE MUTUALLY PERPENDICULAR SEISMOMETERS. EACH SEISMOMETER CONSISTED OF A MOVING COIL AND A FIXED MAGNET. THE OPERATING MODES WERE: SELECTION OF VARIOUS FILTERS FOR FREQUENCY CONTENT OR TO ADJUST TO BEST RECEPTION OF SPECIFIC TYPES OF DATA, A LOW SAMPLING RATE FOR GENERAL ACTIVITY, A HIGH DATA RATE FOR DETAILED EXAMINATION OF EVENTS, AND A COMPRESSED MEDIUM RATE FOR CONTINUOUS MONITORING OF MARSQUAKES THAT WERE DORMANT UNTIL ACTIVATED BY AN EVENT. THE DATA WERE COMPRESSED FOR TRANSMISSION TO EARTH BY AVERAGING THE AMPLITUDE OF NORMAL GROUND NOISE OVER A 15-S PERIOD. WHEN AN EVENT OCCURRED, A TRIGGER ACTIVATED A HIGHER DATA RATE MODE THAT SAMPLED THE AMPLITUDE OF THE OVERALL EVENT ENVELOPE, WHICH REQUIRED ONLY ONE AMPLITUDE SAMPLE PER SECOND TO INDICATE ITS SHAPE. AT THE SAME TIME, THE CHANGE IN POLARITY OF THE DATA SIGNAL (CAUSED BY CROSSING THE ZERO AXIS) WAS SAMPLED ONCE EACH SECOND. THE SHAPE OF THE ENVELOPE AND ITS INCREMENTAL FREQUENCY CONTENT WAS TRANSMITTED TO EARTH AND RECONSTRUCTED TO APPROXIMATE THE ORIGINAL EVENT. THE VIKING 1 SEISMOMETER FAILED TO UNCAGE AND COULD NOT BE USED IN A SEISMIC NETWORK WITH THE VIKING 2 INSTRUMENT.

****

DATA SET NAME- SEISMIC DATA RECORD FORMAT PROGRAM ON MAGNETIC TAPE

NSSDC ID- 75-083C-08A

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

QUANTITY OF DATA- 1 REEL(S) OF MAGNETIC TAPE

BRIEF DESCRIPTION
THESE DATA, SUPPLIED BY THE INVESTIGATION TEAM, CONSIST OF A 7-TRACK, 800-BPI, EVEN PARITY, BCD MAGNETIC TAPE PROGRAM THAT IS USED TO READ THE EDR TAPES DESCRIBED IN DATA SET 75-083C-08B. THIS PROGRAM (EDRFMT) WAS WRITTEN TO REMOVE THE CONTROL WORDS AND TO WRITE THE OUTPUT AS CARD IMAGES, ONE RECORD TO AN IMAGE. THIS WAS NECESSARY BECAUSE THE EDR TAPES WERE WRITTEN IN BCD BY A FORTRAN PROGRAM ON A UNIVAC 1108. WHEN DATA ARE WRITTEN BY A FORTRAN PROGRAM ON THAT MACHINE, ONLY ONE RECORD FORMAT IS PERMISSIBLE, AND THE CONTROL WORDS ARE IN BINARY, NOT BCD, WHICH COMPLICATES THE TASK OF READING THE EDR TAPES.

****

DATA SET NAME- SEISMIC DATA RECORDS ON MAGNETIC TAPE

NSSDC ID- 75-083C-08B

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 09/04/76 TO 02/16/77

QUANTITY OF DATA- 40 REEL(S) OF MAGNETIC TAPE

BRIEF DESCRIPTION
THESE DATA, SUPPLIED BY THE INVESTIGATION TEAM, CONSIST OF 7-TRACK, 800-BPI, EVEN PARITY, BCD MAGNETIC TAPES CREATED ON A UNIVAC 1108 COMPUTER. THE RECORDS ARE ARRANGED IN BUFFERS, WHICH ARE THE BASIC UNITS OF SEISMOMETER DATA. EACH BUFFER HAS TWO HEADER RECORDS CONTAINING INFORMATION SUCH AS TIMING, THE NUMBER OF DATA SAMPLES IN THE BUFFER, AND THE OPERATING STATUS OF THE INSTRUMENT. FOLLOWING THE HEADER RECORDS ARE THE DATA SAMPLES. EACH DATA SAMPLE CONSISTS OF ONE SAMPLE FROM EACH OF THE THREE INDIVIDUAL SEISMOMETERS. IF A SAMPLE IS NOT AVAILABLE FROM A COMPONENT, ZEROS ARE WRITTEN. AT LEAST ONE DATA SAMPLE IS WRITTEN FOR EACH MEASUREMENT PERIOD.

****

DATA SET NAME- SEISMOGRAM RECORDS FOR SOL 1-8 ON MICROFILM

NSSDC ID- 75-083C-08C

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 09/04/76 TO 09/11/76

QUANTITY OF DATA- 1 REEL(S) OF MICROFILM

BRIEF DESCRIPTION
THESE DATA CONSIST OF PLOTS GENERATED FROM THE DATA ON THE EDR MAGNETIC TAPES (75-083C-08B) FOR THE FIRST EIGHT MARTIAN DAYS (SOLS) OF OPERATION. THE PLOTS SHOW TIME VS VOLTAGE. THE PLOTS ARE FOR THE THREE SEISMOMETERS WITH EACH BEING PLOTTED TO SHOW AMPLITUDE AND ZERO CROSSINGS VS TIME. ADDITIONAL INFORMATION SUCH AS FILTER, MODE, AND BOTH UT AND LOCAL MARS TIME, ARE INCLUDED WITH EACH PLOT. THESE EXPERIMENTER-GENERATED PLOTS ARE ALL THAT ARE EXPECTED IN THIS DATA FORM.

****

INVESTIGATION NAME- MAGNETIC PROPERTIES

NSSDC ID- 75-083C-10

PERSONNEL

TL - R.B.	HARGRAVES	PRINCETON U

BRIEF DESCRIPTION
THE MAGNETIC PROPERTIES EXPERIMENT DETECTED THE PRESENCE OF MAGNETIC PARTICLES IN MARTIAN SURFACE MATERIAL. IT USED THREE PAIRS OF SAMARIUM-COBALT MAGNETS, TWO MOUNTED ON THE BACKHOE OF THE SURFACE-SAMPLER COLLECTOR HEAD AND ONE ON TOP OF THE LANDER. EACH PAIR CONSISTED OF AN OUTER RING MAGNET ABOUT 2.5 CM IN DIAMETER WITH AN INNER CORE MAGNET OF OPPOSITE POLARITY. THE MAGNETS WERE DIRECTLY IMAGED BY THE CAMERA SYSTEM IN BLACK AND WHITE AND IN COLOR. A 4-POWER MAGNIFYING MIRROR WAS USED FOR MAXIMUM RESOLUTION.

ORIGINAL PAGE IS
OF POOR QUALITY

****

DATA SET NAME- INDEX OF MAGNET IMAGES ON MICROFICHE

NSSDC ID- 75-083C-10A

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 09/03/76 TO 10/31/76

QUANTITY OF DATA- 1 CARD(S) OF B/W MICROFICHE

BRIEF DESCRIPTION
THESE DATA ARE ON B/W MICROFICHE GENERATED AT NSSDC FROM A HARDCOPY INDEX SUPPLIED BY THE INVESTIGATOR. THIS INDEX LISTS THE LANDER CAMERA IMAGES TAKEN OF THE MAGNET PAIRS MOUNTED ON THE SAMPLER ARM AND THE LANDER BODY. THE LISTING CONTAINS THE MARTIAN DAY (SOL); IMAGE REFERENCE NUMBER BY CE LABEL; RESOLUTION; IF COLOR, BLACK AND WHITE, OR INFRARED; IF IN THE SUN OR SHADED; AND COMMENTS.

****

DATA SET NAME- MAGNET IMAGES ON ROLL FILM

NSSDC ID- 75-083C-10B

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 09/03/76 TO 10/31/76

QUANTITY OF DATA- 47 FRAMES

BRIEF DESCRIPTION
THESE DATA ARE ON 5-IN. B/W ROLL FILM GENERATED AT NSSDC FROM LANDER CAMERA IMAGES SUPPLIED BY THE LANDER IMAGING TEAM. THESE DATA ARE THE BEST IMAGES OF THE MAGNET PAIRS TAKEN BY THE LANDER CAMERA. THEY ARE ALSO AVAILABLE AS INDIVIDUAL B/W FRAMES.

****

INVESTIGATION NAME- LANDER RADIO SCIENCE

NSSDC ID- 75-083C-11

PERSONNEL

TL - W.H.	MICHAEL, JR.	NASA-LARC
TM - I.I.	SHAPIRO	MASS INST OF TECH
TM - G.	FJELDBO	NASA-JPL
TM - J.G.	DAVIES	U OF MANCHESTER
TM - D.L.	CAIN	NASA-JPL
TM - M.D.	GROSSI	RAYTHEON CORP
TM - G.L.	TYLER	STANFORD U
TM - J.	BRENKLE	NASA-JPL
TM - R.H.	TOLSON	NASA-LARC
TM - C.T.	STELZRIED	NASA-JPL
TM - G.	BORN	NASA-JPL
TM - R.	REASENBERG	MASS INST OF TECH

BRIEF DESCRIPTION
THIS EXPERIMENT USED THE S-BAND RADIO TRANSMITTER TO ACQUIRE DOPPLER AND RANGE DATA FOR THE LANDER, UTILIZING THE SAME DEEP SPACE NETWORK FACILITIES THAT WERE USED BY THE ORBITERS. THE RESULTING DATA WERE USED TO DETERMINE THE LOCATION OF THE LANDER ON THE PLANET SURFACE. THEY ALSO PROVIDE MORE PRECISE INFORMATION ABOUT THE ORBITAL, ROTATIONAL, AND PRECESSIONAL MOTION OF MARS THAN HAS PREVIOUSLY BEEN AVAILABLE. THE TWO PRINCIPAL DIFFERENCES BETWEEN ORBITER AND LANDER TRACKING DATA ARE: (1) LANDER TRACKING PERIODS ARE NEVER LONGER THAN 2 H AND ARE SOMETIMES MUCH SHORTER BECAUSE OF THERMAL CONSTRAINTS ON THE DURATION OF LANDER TRANSMITTER OPERATION, AND (2) LANDERS HAVE NO X-BAND SIGNALS TO PROVIDE THE CORRECTIONS TO RANGE DATA FOR THE INTERPLANETARY PLASMA EFFECTS. CONSEQUENTLY, LANDER RANGING SESSIONS WERE SCHEDULED TO BE NEARLY SIMULTANEOUS WITH ORBITER RANGING WHENEVER POSSIBLE, SO THAT THE ORBITER S- AND X-BAND DATA COULD SUPPLY THESE CORRECTIONS.

****

DATA SET NAME- DOPPLER AND RANGE TRACKING DATA ON MAGNETIC TAPE

NSSDC ID- 75-083C-11B

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

QUANTITY OF DATA- 1 REEL(S) OF MAGNETIC TAPE

BRIEF DESCRIPTION
THIS DATA SET, SUPPLIED BY THE RADIO SCIENCE TEAM, IS CONTAINED ON 7-TRACK, 800-BPI TAPES THAT ARE MERGED AND REFORMATTED VERSIONS OF THE ORIGINAL PROJECT TRACKING TAPES, AND HAVE ESSENTIALLY THE SAME FORMAT AS THE ORBITER TAPES. EACH RECORD CONTAINS ALL, OR A SUBSET OF, THE FOLLOWING PARAMETERS: TIME, DOPPLER FREQUENCY, RANGE (I.E., LIGHT TIME IN NANOSECONDS), AND CERTAIN TRACKING STATION INFORMATION. SPACING BETWEEN DOPPLER POINTS IS USUALLY 10 S; BETWEEN RANGING POINTS IT IS FROM 2 TO 20 MIN. EACH TAPE CONTAINS DATA FROM ONE SPACECRAFT. A SET OF IBM CARDS LISTING THE RANGE HARDWARE DELAY CALIBRATION DATA IS INCLUDED WITH THESE DATA. THE CALIBRATIONS ARE GIVEN FOR THE COMBINED EFFECT OF THE SIGNAL DELAYS CAUSED BY BOTH A TRACKING STATION'S EQUIPMENT AND THE SPACECRAFT TRANSPONDER.

****

DATA SET NAME- DECALIBRATED LANDER RANGE DATA ON MAGNETIC TAPE

NSSDC ID- 75-083C-11C

AVAILABILITY OF DATA SET- DATA IDENTIFIED BUT NOT RECEIVED

BRIEF DESCRIPTION
THIS DATA SET, SUPPLIED BY THE RADIO SCIENCE TEAM, IS CONTAINED ON 7-TRACK, 800-BPI TAPES. FOR THE 'GOOD' RANGE POINTS, WHICH ARE A SUBSET OF THE RANGE POINTS ON THE TRACKING DATA TAPES (75-083C-11B), THE RESULTS OF AN EXTENSIVE CALIBRATION PROGRAM ARE PRESENTED. THE PARAMETERS LISTED ARE TIME, UNCORRECTED RANGE IN NANOSECONDS, CORRECTION FOR TIME DELAY IN THE LANDER TRANSPONDER, CORRECTION FOR TIME DELAY IN THE TRACKING STATION EQUIPMENT, CORRECTION FOR THE INTERPLANETARY PLASMA EFFECT (FROM NEAR-SIMULTANEOUS ORBITER S- AND X-BAND DATA), AND FINAL CORRECTED RANGE. THE FINAL CORRECTED RANGE SHOULD BE THE BEST OBTAINABLE VALUE OF THE RANGE BETWEEN THE TRACKING STATION ANTENNAS AND THE LANDER.

****

INVESTIGATION NAME- ENTRY SCIENCE NEUTRAL ATMOSPHERIC COMPOSITION

NSSDC ID- 75-083C-12

PERSONNEL

TL - A.O.C.NIER		U OF MINNESOTA
TM - M.B.	MCELROY	HARVARD U
TM - N.W.	SPENCER	NASA-GSFC

BRIEF DESCRIPTION
THE VIKING ENTRY SCIENCE NEUTRAL ATMOSPHERIC COMPOSITION EXPERIMENT (ONE OF THREE THAT WERE PART OF THE ENTRY SCIENCE INVESTIGATION) WAS DESIGNED TO PROVIDE THE COMPOSITION DATA FOR THE VARIOUS NEUTRAL SPECIES THAT WERE NEEDED TO DEFINE THE PRESENT PHYSICAL AND CHEMICAL STATE OF THE MARTIAN ATMOSPHERE. MOUNTED IN AN OPENING IN THE AEROSHELL WITH ITS ELECTRON-IMPACT OPEN ION SOURCE RECESSED BELOW THE SURFACE OF THE AEROSHELL, A DOUBLE-FOCUSING (ELECTROSTATIC AND MAGNETIC) MASS SPECTROMETER WAS USED TO MEASURE THE CONCENTRATIONS OF THE ATMOSPHERIC SPECIES THAT HAVE MASS-TO-CHARGE RATIOS FROM 1 TO 49. TWO COLLECTORS WERE USED, ONE COVERING THE MASS RANGE FROM 1 TO 7 U, AND THE OTHER SIMULTANEOUSLY COVERING THE RANGE FROM 7 TO 49 U. MASS SPECTRA WERE OBTAINED BY SWEEPING THE ION ACCELERATION VOLTAGE AND THE DEFLECTION VOLTAGE ACROSS THE ELECTROSTATIC PLATES. THE SWEEP PERIOD WAS APPROXIMATELY 5 S, AND A DYNAMIC RANGE OF 1.E5 WAS PROVIDED WITHIN EACH SPECTRUM.

****

DATA SET NAME- TIME-ORDERED MASS SPECTRA PLOTS ON MICROFILM

NSSDC ID- 75-083C-12A

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 09/03/76 TO 09/03/76

QUANTITY OF DATA- 1 REEL(S) OF MICROFILM

BRIEF DESCRIPTION
THIS 16-MM MICROFILM DATA SET WAS GENERATED AT NSSDC FROM HARDCOPY DATA PLOTS SUPPLIED BY THE INVESTIGATION TEAM. THESE DATA INCLUDE TIME-ORDERED MASS SPECTRA PLOTS DISPLAYED ON A SEMILOG GRAPH. THE ORDINATE SCALE IS ION CURRENT, AND THE LINEAR ABSCISSA SCALE IS WORD NUMBER. BENEATH THE ABSCISSA IS PRINTED SPACECRAFT TIME (MEASURED FROM THE TIME OF DEORBIT) AND UNIVERSAL TIME. WITH THE ACCOMPANYING DOCUMENTATION, IT IS POSSIBLE TO CONVERT CURRENT VALUES TO AMBIENT PARTICLE NUMBER DENSITIES, WORD NUMBER TO ATOMIC MASS, AND TIME INTO ALTITUDE IN KILOMETERS.

****

DATA SET NAME- TIME-ORDERED ION CURRENT LISTINGS ON MICROFILM

NSSDC ID- 75-083C-12B

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 09/03/76 TO 09/03/76

QUANTITY OF DATA- 1 REEL(S) OF MICROFILM

BRIEF DESCRIPTION
THIS 16-MM MICROFILM DATA SET WAS GENERATED AT NSSDC FROM HARDCOPY TABULATED DATA PROVIDED BY THE INVESTIGATION TEAM. THESE DATA CONSIST OF THE TIME-ORDERED ION CURRENT LISTINGS FROM WHICH THE MASS SPECTRA PLOTS WERE PRODUCED. THE ITEMS TABULATED INCLUDE: WORD NUMBER, FRAME NUMBER, ELECTROMETER CURRENT READINGS, AND GAIN STEP. AT THE END OF THE FILM ARE ADDITIONAL ION CURRENT DATA NOT IN TEMPORAL ORDER AND MISCELLANEOUS HOUSEKEEPING DATA. THE ACCOMPANYING DOCUMENTS

PERMIT THE CONVERSION OF CURRENT TO AMBIENT PARTICLE NUMBER DENSITY, WORD NUMBER TO ATOMIC MASS, AND TIME TO ALTITUDE IN KILOMETERS.

****

INVESTIGATION NAME- INORGANIC ANALYSIS

NSSDC ID- 75-083C-13

PERSONNEL

TL - P.	TOULMIN, 3RD	US GEOLOGICAL SURVEY
TM - A.K.	BAIRD	POMONA COLLEGE
TM - K.	KEIL	U OF NEW MEXICO
TM - H.J.	ROSE	US GEOLOGICAL SURVEY
TM - B.C.	CLARK	MARTIN-MARIETTA AEROSP

BRIEF DESCRIPTION

THIS EXPERIMENT UTILIZED AN ENERGY-DISPERSIVE X-RAY FLUORESCENCE SPECTROMETER (XRFS) IN WHICH FOUR SEALED, GAS-FILLED PROPORTIONAL COUNTERS (PC'S) DETECTED X-RAYS EMITTED FROM SAMPLES OF MARTIAN SURFACE MATERIALS IRRADIATED BY X-RAYS FROM RADIOISOTOPE SOURCES (IRON-55 AND CADMIUM-109). THE OUTPUT OF THE PROPORTIONAL COUNTERS WAS SUBJECTED TO PULSE HEIGHT ANALYSIS BY AN ONBOARD STEP-SCANNING, SINGLE-CHANNEL ANALYZER WITH ADJUSTABLE COUNTING PERIODS. THIS INSTRUMENT WAS LOCATED INSIDE THE LANDER BODY, AND SAMPLES WERE DELIVERED TO IT BY THE LANDER SURFACE SAMPLER. CALIBRATION STANDARDS WERE AN INTEGRAL PART OF THE INSTRUMENT. RECONSTRUCTED SPECTRA YIELDED SURFACE COMPOSITION DATA WITH ACCURACIES RANGING FROM A FEW TENS OF PARTS PER MILLION FOR TRACE ELEMENTS TO A FEW PERCENT FOR MAJOR ELEMENTS.

****

DATA SET NAME- SPECTRA PLOTS ON MICROFICHE

NSSDC ID- 75-083C-13A

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 09/05/76 TO 11/09/76

QUANTITY OF DATA- 6 CARD(S) OF B/W MICROFICHE

BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF B/W MICROFICHE PROVIDED BY THE INVESTIGATION TEAM CONTAINING LOGARITHMIC PLOTS OF THE DATA IN THE SPECTRAL HISTORY FILE (SEE 75-083C-13E). THE TITLE ON EACH PLOT INCLUDES LANDER ID, SPECTRUM NUMBER, PC TUBE, SAMPLE OR CALIBRATION INFORMATION, COMMAND HISTORY INFORMATION, COUNT PERIOD (IF OTHER THAN 7.7 S), OPERATOR, DETECTOR VOLTAGE, AND DATE. THE X-AXIS REPRESENTS ENERGY (CHANNEL NUMBER), AND THE Y-AXIS REPRESENTS INTENSITY THAT HAS BEEN NORMALIZED TO REFLECT A 30.7-S COUNT PERIOD/CHANNEL. THE PC 1 AND 2 DATA REPRESENT THE IRON-55 RADIATION SOURCE INFORMATION WHILE PC 3 AND 4 DATA REPRESENT THE CADMIUM-109 INFORMATION.

****

DATA SET NAME- COMMAND, SPECTRA, AND TEMPERATURE HISTORY ON MAGNETIC TAPE

NSSDC ID- 75-083C-13E

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 09/03/76 TO 11/01/76

QUANTITY OF DATA- 1 REEL(S) OF MAGNETIC TAPE

BRIEF DESCRIPTION

THESE DATA ARE ON 7-TRACK, 800-BPI, BCD, EVEN PARITY MAGNETIC TAPE SUPPLIED BY THE INVESTIGATION TEAM. EACH TAPE CONTAINS THREE FILES. THE COMMAND HISTORY (FILE 1) CONTAINS THE INSTRUMENT PARAMETERS THAT WERE SENT TO THE GUIDANCE CONTROL AND SEQUENCING COMPUTER (GCSC). THE FILE CONSISTS OF A HEADER; THE NUMBER OF COMMANDS IN EACH GROUP; THE NUMBER OF THE FIRST COMMAND IN EACH GROUP; THE PURPOSE; THE COMMAND TABLE NUMBER; THE NUMBER OF THE OFFSET ENTRY; THE PC TUBE NUMBER; THE HIGH-VOLTAGE BIAS; THE CODE USED TO IDENTIFY DUMP, FLAG, OR SAMPLE INFORMATION; THE COUNT PERIOD PER CHANNEL; THE WINDOW GROUP (START CHANNEL); THE EXECUTION TIME; THE TIME IN SECONDS TO BEGIN EXECUTION ON MARS; AND THE PREDICTED NUMBER OF DATA FRAMES. THE TEMPERATURE HISTORY FILE (FILE 2) CONTAINS TEMPERATURE MEASUREMENTS IN THE XRFS BOX. THE FILE CONSISTS OF A HEADER, THE TOTAL NUMBER OF TEMPERATURE GROUPS AS PROVIDED BY THE VIKING DATA SOFTWARE (EACH GROUP CONTAINS A MAXIMUM OF 675 MEASUREMENTS), THE NUMBER OF GROUPS STORED IN THE FILE, THE TEMPERATURE READINGS IN THE XRFS BOX, AND THE GCSC TIME (IN SECONDS) WHEN EACH TEMPERATURE WAS MEASURED. THE SPECTRAL HISTORY FILE (FILE 3) CONTAINS THE INSTRUMENT RESPONSE DATA. THE FILE CONSISTS OF A HEADER, THE SPECTRUM NAME, RAW SPECTRUM DATA NORMALIZED TO A COUNT TIME OF 30.7 S PER CHANNEL, THE PC TUBE THAT GENERATED THE SPECTRUM, THE TIME AND DATE THE SPECTRUM WAS ASSEMBLED AT JPL, THE DATA FRAME NUMBERS USED TO MAKE THE SPECTRUM, THE COUNT PERIOD FOR EACH DATA FRAME, AND THE NAME OF THE OPERATOR WHO GENERATED THE SPECTRUM.

****

INVESTIGATION NAME- ENTRY SCIENCE IONOSPHERIC PROPERTIES

NSSDC ID- 75-083C-14

PERSONNEL

TL - A.O.C.NIER		U OF MINNESOTA
TM - W.B.	HANSON	U OF TEXAS, DALLAS
TM - N.W.	SPENCER	NASA-GSFC

BRIEF DESCRIPTION

THE VIKING ENTRY SCIENCE IONOSPHERIC PROPERTIES EXPERIMENT (ONE OF THREE THAT WERE PART OF THE ENTRY SCIENCE INVESTIGATION) STUDIED THE COMPOSITION, STRUCTURE, AND TEMPERATURE OF THE IONOSPHERE, WHICH WERE PROBED DURING THE DESCENT OF THE LANDER CAPSULE BY MEANS OF RETARDING POTENTIAL ANALYZER (RPA) MOUNTED FLUSH WITH THE FRONT FACE OF THE AEROSHELL. TO CONSERVE BATTERY POWER, THE INSTRUMENT WAS OPERATED INTERMITTENTLY BETWEEN 16,000 AND 5,000 KM ALTITUDE BUT CONTINUOUSLY FROM 5,000 TO 100 KM. THE INSTRUMENT COMPRISED A CURRENT-COLLECTING PLATE WITH SEVEN GRIDS AHEAD OF IT. A FIXED PROGRAM OF POTENTIALS WAS APPLIED TO THE GRIDS, AND THE COLLECTED CURRENTS WERE MEASURED AT 10-MS INTERVALS. THE INSTRUMENT OPERATED IN THREE PHASES TO MEASURE ENERGETIC ELECTRONS, THERMAL ELECTRONS, AND THERMAL IONS.

****

DATA SET NAME- TRAJECTORY AND ATTITUDE DATA ON TAPE

NSSDC ID- 75-083C-14A

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 09/03/76 TO 09/03/76

QUANTITY OF DATA- 1 REEL(S) OF MAGNETIC TAPE

BRIEF DESCRIPTION

THESE DATA, SUPPLIED BY THE INVESTIGATION TEAM, ARE ON 9-TRACK, BINARY, 1600-BPI, UNLABELED TAPE, AND CONTAIN TRAJECTORY AND ATTITUDE DATA FOR THE VIKING 1 AND 2 LANDERS. THERE IS ONE FILE FOR EACH SPACECRAFT. EACH RECORD IN A FILE CONTAINS THE FOLLOWING PARAMETERS: TIME IN SECONDS FROM DEORBIT; VELOCITY IN KM/S; ALTITUDE ABOVE MARS' MEAN SURFACE IN KILOMETERS; AND FLIGHT ANGLE, HEADING ANGLE, SUB-LANDER LATITUDE, SUB-LANDER LONGITUDE, RPA ANGLE OF ATTACK, UAMS ANGLE OF ATTACK, RPA SUN ANGLE, AND ZENITH ANGLE ALL MEASURED IN DEGREES.

****

DATA SET NAME- RPA ION AND ELECTRON DATA ON TAPE

NSSDC ID- 75-083C-14B

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 09/03/76 TO 09/03/76

QUANTITY OF DATA- 1 REEL(S) OF MAGNETIC TAPE

BRIEF DESCRIPTION

THESE DATA, SUPPLIED BY THE INVESTIGATION TEAM, ARE ON 9-TRACK, 1600-BPI, BINARY TAPE. THE DATA CONTAIN THE COMPLETE RECORD OF THE COLLECTED CURRENT VS RETARDING POTENTIAL AS A FUNCTION OF TIME FOR BOTH LANDERS IN BOTH THE ELECTRON AND ION MODES. THERE ARE FOUR FILES ON THIS TAPE, AND EACH RECORD CONTAINS TIME IN SECONDS FROM DEORBIT, SEQUENTIAL FRAME NUMBER, MAJOR FRAME NUMBER, AND PAIRS OF RETARDING POTENTIAL AND COLLECTOR CURRENT VALUES.

****

DATA SET NAME- RPA ION AND ELECTRON DATA ON MICROFILM

NSSDC ID- 75-083C-14C

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME PERIOD COVERED- 09/03/76 TO 09/03/76

QUANTITY OF DATA- 2 REEL(S) OF MICROFILM

BRIEF DESCRIPTION

THESE DATA, SUPPLIED BY THE INVESTIGATION TEAM, ARE ON 16-MM MICROFILM. THE DATA ARE ESSENTIALLY THE SAME AS THE MAGNETIC TAPE DATA SET (75-083C-14B) AND INCLUDE CURRENT VS RETARDING POTENTIAL PLOTS FOR EACH INDIVIDUAL SWEEP IN THE ENERGETIC ELECTRON MODE; SIMILAR PLOTS FOR THERMAL IONS WITH THE LEAST-SQUARES FIT TO THE THEORETICAL EQUATION TO DETERMINE CONCENTRATIONS, TEMPERATURE, AND OTHER PARAMETERS; AND TIME PLOTS OF ALTITUDE, VELOCITY, AND PERTINENT ANGLES TO DEFINE THE INSTRUMENT ENVIRONMENT DURING THE ENTRY.

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INVESTIGATOR NAME INDEX

This index contains an alphabetical listing of the names of the team leaders and team members associated with each experiment described in the Data Descriptions section of this *Catalog*. The organizational affiliation of the person is also shown. Listed under each person's name are the associated experiment names along with the spacecraft name, the NSSDC ID code assigned to the experiment, and the page number referencing the description of the experiment. An asterisk preceding the experiment name identifies the person associated with that experiment as the team leader.

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ANDERSON, D.L. - CALIF INST OF TECH, PASADENA, CA
*VIKING 2 LANDER, SEISMOLOGY (75-083C-08) ... 19

ANDERSON, D.M. - USA-CRREL, HANOVER, NH
VIKING 1 LANDER, MOLECULAR ANALYSIS (75-075C-04) ... 8
VIKING 2 LANDER, MOLECULAR ANALYSIS (75-083C-04) ... 16

BAIRD, A.K. - POMONA COLLEGE, CLAREMONT, CA
VIKING 1 LANDER, INORGANIC ANALYSIS (75-075C-13) ... 11
VIKING 2 LANDER, INORGANIC ANALYSIS (75-083C-13) ... 21

BAUM, W.A. - LOWELL OBSERVATORY, FLAGSTAFF, AZ
VIKING 1 ORBITER, ORBITER IMAGING (75-075A-01) ... 4
VIKING 2 ORBITER, ORBITER IMAGING (75-083A-01) ... 13

BIEMANN, K. - MASS INST OF TECH, CAMBRIDGE, MA
*VIKING 1 LANDER, MOLECULAR ANALYSIS (75-075C-04) ... 8
*VIKING 2 LANDER, MOLECULAR ANALYSIS (75-083C-04) ... 16

BINDER, A.B. - SCIENCE APPL, INC, TUCSON, AZ
VIKING 1 LANDER, LANDER IMAGING (75-075C-06) ... 8
VIKING 2 LANDER, LANDER IMAGING (75-083C-06) ... 17

BLASIUS, K.R. - PLANETARY SCIENCE INST, TUCSON, AZ
VIKING 1 ORBITER, ORBITER IMAGING (75-075A-01) ... 4
VIKING 2 ORBITER, ORBITER IMAGING (75-083A-01) ... 13

BORN, G. - NASA-JPL, PASADENA, CA
VIKING 1 LANDER, LANDER RADIO SCIENCE (75-075C-11) ... 11
VIKING 1 ORBITER, ORBITER RADIO SCIENCE (75-075A-04) ... 6
VIKING 2 LANDER, LANDER RADIO SCIENCE (75-083C-11) ... 20
VIKING 2 ORBITER, ORBITER RADIO SCIENCE (75-083A-04) ... 15

BRENKLE, J.P. - NASA-JPL, PASADENA, CA
VIKING 1 LANDER, LANDER RADIO SCIENCE (75-075C-11) ... 11
VIKING 1 ORBITER, ORBITER RADIO SCIENCE (75-075A-04) ... 6
VIKING 2 LANDER, LANDER RADIO SCIENCE (75-083C-11) ... 20
VIKING 2 ORBITER, ORBITER RADIO SCIENCE (75-083A-04) ... 15

BRIGGS, G.A. - NASA-JPL, PASADENA, CA
VIKING 1 ORBITER, ORBITER IMAGING (75-075A-01) ... 4
VIKING 2 ORBITER, ORBITER IMAGING (75-083A-01) ... 13

CAIN, D.L. - NASA-JPL, PASADENA, CA
VIKING 1 LANDER, LANDER RADIO SCIENCE (75-075C-11) ... 11
VIKING 1 ORBITER, ORBITER RADIO SCIENCE (75-075A-04) ... 6
VIKING 2 LANDER, LANDER RADIO SCIENCE (75-083C-11) ... 20
VIKING 2 ORBITER, ORBITER RADIO SCIENCE (75-083A-04) ... 15

CARR, M.H. - US GEOLOGICAL SURVEY, MENLO PARK, CA
*VIKING 1 ORBITER, ORBITER IMAGING (75-075A-01) ... 4
*VIKING 2 ORBITER, ORBITER IMAGING (75-083A-01) ... 13

CHASE, JR., S.C. - SANTA BARBARA RES CTR, GOLETA, CA
VIKING 1 ORBITER, INFRARED THERMAL MAPPING (IRTM) (75-075A-02) ... 6
VIKING 2 ORBITER, INFRARED THERMAL MAPPING (IRTM) (75-083A-02) ... 14

CLARK, B.C. - MARTIN-MARIETTA AEROSP, DENVER, CO
VIKING 1 LANDER, INORGANIC ANALYSIS (75-075C-13) ... 11
VIKING 2 LANDER, INORGANIC ANALYSIS (75-083C-13) ... 21

CUTTS, J.A. - SCIENCE APPL, INC, PASADENA, CA
VIKING 1 ORBITER, ORBITER IMAGING (75-075A-01) ... 4
VIKING 2 ORBITER, ORBITER IMAGING (75-083A-01) ... 13

DAVIES, D.W. - NASA-JPL, PASADENA, CA
VIKING 1 ORBITER, MARS ATMOSPHERIC WATER DETECTION (MAWD) (75-075A-03) ... 6
VIKING 2 ORBITER, MARS ATMOSPHERIC WATER DETECTION (MAWD) (75-083A-03) ... 15

DAVIES, J.G. - U OF MANCHESTER, MANCHESTER, ENGLAND
VIKING 1 LANDER, LANDER RADIO SCIENCE (75-075C-11) ... 11
VIKING 1 ORBITER, ORBITER RADIO SCIENCE (75-075A-04) ... 6
VIKING 2 LANDER, LANDER RADIO SCIENCE (75-083C-11) ... 20
VIKING 2 ORBITER, ORBITER RADIO SCIENCE (75-083A-04) ... 15

DUENNEBIER, F. - U OF HAWAII, HONOLULU, HI
VIKING 2 LANDER, SEISMOLOGY (75-083C-08) ... 19

DUXBURY, T.C. - NASA-JPL, PASADENA, CA
VIKING 1 ORBITER, ORBITER IMAGING (75-075A-01) ... 4
VIKING 2 ORBITER, ORBITER IMAGING (75-083A-01) ... 13

FARMER, C.B. - NASA-JPL, PASADENA, CA
*VIKING 1 ORBITER, MARS ATMOSPHERIC WATER DETECTION (MAWD) (75-075A-03) ... 6
*VIKING 2 ORBITER, MARS ATMOSPHERIC WATER DETECTION (MAWD) (75-083A-03) ... 15

FJELDBO, G. - NASA-JPL, PASADENA, CA
VIKING 1 LANDER, LANDER RADIO SCIENCE (75-075C-11) ... 11
VIKING 1 ORBITER, ORBITER RADIO SCIENCE (75-075A-04) ... 6
VIKING 2 LANDER, LANDER RADIO SCIENCE (75-083C-11) ... 20
VIKING 2 ORBITER, ORBITER RADIO SCIENCE (75-083A-04) ... 15

GREELEY, R. - ARIZONA STATE U, TUCSON, AZ
VIKING 1 ORBITER, ORBITER IMAGING (75-075A-01) ... 4
VIKING 2 ORBITER, ORBITER IMAGING (75-083A-01) ... 13

ORIGINAL PAGE IS
OF POOR QUALITY

INVESTIGATORS AND EXPERIMENTS	PAGE
GROSSI, M.D. - RAYTHEON CORP, SUDBURY, MA	
VIKING 1 LANDER, LANDER RADIO SCIENCE (75-075C-11)	11
VIKING 1 ORBITER, ORBITER RADIO SCIENCE (75-075A-04)	6
VIKING 2 LANDER, LANDER RADIO SCIENCE (75-083C-11)	20
VIKING 2 ORBITER, ORBITER RADIO SCIENCE (75-083A-04)	15
GUEST, J.E. - U OF LONDON, LONDON, ENGLAND	
VIKING 1 ORBITER, ORBITER IMAGING (75-075A-01)	4
VIKING 2 ORBITER, ORBITER IMAGING (75-083A-01)	13
HANSON, W.B. - U OF TEXAS, DALLAS, DALLAS, TX	
VIKING 1 LANDER, ENTRY SCIENCE IONOSPHERIC PROPERTIES (75-075C-14)	12
VIKING 2 LANDER, ENTRY SCIENCE IONOSPHERIC PROPERTIES (75-083C-14)	21
HARGRAVES, R.B. - PRINCETON U, PRINCETON, NJ	
*VIKING 1 LANDER, MAGNETIC PROPERTIES (75-075C-10)	10
*VIKING 2 LANDER, MAGNETIC PROPERTIES (75-083C-10)	19
HENRY, R.M. - NASA-LARC, HAMPTON, VA	
VIKING 1 LANDER, METEOROLOGY (75-075C-07)	10
VIKING 2 LANDER, METEOROLOGY (75-083C-07)	18
HESS, S.L. - FLORIDA STATE U, TALLAHASSEE, FL	
*VIKING 1 LANDER, METEOROLOGY (75-075C-07)	10
*VIKING 2 LANDER, METEOROLOGY (75-083C-07)	18
HOROWITZ, N.H. - CALIF INST OF TECH, PASADENA, CA	
VIKING 1 LANDER, BIOLOGY (75-075C-03)	7
VIKING 2 LANDER, BIOLOGY (75-083C-03)	16
HOWARD, K.A. - US GEOLOGICAL SURVEY, MENLO PARK, CA	
VIKING 1 ORBITER, ORBITER IMAGING (75-075A-01)	4
VIKING 2 ORBITER, ORBITER IMAGING (75-083A-01)	13
HUCK, F.O. - NASA-LARC, HAMPTON, VA	
VIKING 1 LANDER, LANDER IMAGING (75-075C-06)	8
VIKING 2 LANDER, LANDER IMAGING (75-083C-06)	17
HUTTON, R.E. - TRW SYSTEMS GROUP, REDONDO BEACH, CA	
VIKING 1 LANDER, PHYSICAL PROPERTIES (75-075C-01)	7
VIKING 2 LANDER, PHYSICAL PROPERTIES (75-083C-01)	16
KEIL, K. - U OF NEW MEXICO, ALBUQUERQUE, NM	
VIKING 1 LANDER, INORGANIC ANALYSIS (75-075C-13)	11
VIKING 2 LANDER, INORGANIC ANALYSIS (75-083C-13)	21
KIEFFER, H.H. - U OF CALIF, LA, LOS ANGELES, CA	
*VIKING 1 ORBITER, INFRARED THERMAL MAPPING (IRTM) (75-075A-02)	6
*VIKING 2 ORBITER, INFRARED THERMAL MAPPING (IRTM) (75-083A-02)	14
KLEIN, H.P. - NASA-ARC, MOFFETT FIELD, CA	
*VIKING 1 LANDER, BIOLOGY (75-075C-03)	7
*VIKING 2 LANDER, BIOLOGY (75-083C-03)	16
KOVACH, R.L. - STANFORD U, PALO ALTO, CA	
VIKING 2 LANDER, SEISMOLOGY (75-083C-08)	19
LAPORTE, D.D. - SANTA BARBARA RES CTR, GOLETA, CA	
VIKING 1 ORBITER, MARS ATMOSPHERIC WATER DETECTION (MAWD) (75-075A-03)	6
VIKING 2 ORBITER, MARS ATMOSPHERIC WATER DETECTION (MAWD) (75-083A-03)	15
LATHAM, G.V. - U OF TEXAS, GALVESTON, GALVESTON, TX	
VIKING 2 LANDER, SEISMOLOGY (75-083C-08)	19
LEDERBERG, J. - STANFORD U, PALO ALTO, CA	
VIKING 1 LANDER, BIOLOGY (75-075C-03)	7
VIKING 2 LANDER, BIOLOGY (75-083C-03)	16
LEOVY, C.B. - U OF WASHINGTON, SEATTLE, WA	
VIKING 1 LANDER, METEOROLOGY (75-075C-07)	10
VIKING 2 LANDER, METEOROLOGY (75-083C-07)	18
LEVIN, G.V. - BIOSPHERICS, INC, ROCKVILLE, MD	
VIKING 1 LANDER, BIOLOGY (75-075C-03)	7
VIKING 2 LANDER, BIOLOGY (75-083C-03)	16
LEVINTHAL, E.C. - STANFORD U, PALO ALTO, CA	
VIKING 1 LANDER, LANDER IMAGING (75-075C-06)	8
VIKING 2 LANDER, LANDER IMAGING (75-083C-06)	17
LIEBES, JR., S. - STANFORD U, PALO ALTO, CA	
VIKING 1 LANDER, LANDER IMAGING (75-075C-06)	8
VIKING 2 LANDER, LANDER IMAGING (75-083C-06)	17
MASURSKY, H. - US GEOLOGICAL SURVEY, FLAGSTAFF, AZ	
VIKING 1 ORBITER, ORBITER IMAGING (75-075A-01)	4
VIKING 2 ORBITER, ORBITER IMAGING (75-083A-01)	13
MCELROY, M.B. - HARVARD U, CAMBRIDGE, MA	
VIKING 1 LANDER, ENTRY SCIENCE NEUTRAL ATMOSPHERIC COMPOSITION (75-075C-12)	11
VIKING 2 LANDER, ENTRY SCIENCE NEUTRAL ATMOSPHERIC COMPOSITION (75-083C-12)	20
MICHAEL, JR., W.H. - NASA-LARC, HAMPTON, VA	
*VIKING 1 LANDER, LANDER RADIO SCIENCE (75-075C-11)	11
*VIKING 1 ORBITER, ORBITER RADIO SCIENCE (75-075A-04)	6

*VIKING 2 LANDER, LANDER RADIO SCIENCE (75-083C-11)..... 20
*VIKING 2 ORBITER, ORBITER RADIO SCIENCE (75-083A-04)..... 15

MINER, E.D. - NASA-JPL, PASADENA, CA
VIKING 1 ORBITER, INFRARED THERMAL MAPPING (IRTM) (75-075A-02)..... 6
VIKING 2 ORBITER, INFRARED THERMAL MAPPING (IRTM) (75-083A-02)..... 14

MOORE, II, H.J. - US GEOLOGICAL SURVEY, MENLO PARK, CA
VIKING 1 LANDER, PHYSICAL PROPERTIES (75-075C-01)..... 7
VIKING 2 LANDER, PHYSICAL PROPERTIES (75-083C-01)..... 16

MORRIS, E.C. - US GEOLOGICAL SURVEY, FLAGSTAFF, AZ
VIKING 1 LANDER, LANDER IMAGING (75-075C-06)..... 8
VIKING 2 LANDER, LANDER IMAGING (75-083C-06)..... 17

MUNCH, G. - CALIF INST OF TECH, PASADENA, CA
VIKING 1 ORBITER, INFRARED THERMAL MAPPING (IRTM) (75-075A-02)..... 6
VIKING 2 ORBITER, INFRARED THERMAL MAPPING (IRTM) (75-083A-02)..... 14

MUTCH, T.A. - BROWN U, PROVIDENCE, RI
*VIKING 1 LANDER, LANDER IMAGING (75-075C-06)..... 8
*VIKING 2 LANDER, LANDER IMAGING (75-083C-06)..... 17

NEUGEBAUER, G. - CALIF INST OF TECH, PASADENA, CA
VIKING 1 ORBITER, INFRARED THERMAL MAPPING (IRTM) (75-075A-02)..... 6
VIKING 2 ORBITER, INFRARED THERMAL MAPPING (IRTM) (75-083A-02)..... 14

NIER, A.O.C. - U OF MINNESOTA, MINNEAPOLIS, MN
*VIKING 1 LANDER, ENTRY SCIENCE ATMOSPHERIC STRUCTURE (75-075C-02)..... 7
VIKING 1 LANDER, MOLECULAR ANALYSIS (75-075C-04)..... 8
*VIKING 1 LANDER, ENTRY SCIENCE NEUTRAL ATMOSPHERIC COMPOSITION (75-075C-12)..... 11
*VIKING 1 LANDER, ENTRY SCIENCE IONOSPHERIC PROPERTIES (75-075C-14)..... 12
*VIKING 2 LANDER, ENTRY SCIENCE ATMOSPHERIC STRUCTURE (75-083C-02)..... 16
VIKING 2 LANDER, MOLECULAR ANALYSIS (75-083C-04)..... 16
*VIKING 2 LANDER, ENTRY SCIENCE NEUTRAL ATMOSPHERIC COMPOSITION (75-083C-12)..... 20
*VIKING 2 LANDER, ENTRY SCIENCE IONOSPHERIC PROPERTIES (75-083C-14)..... 21

ORGEL, L.E. - SALK INST BIOL STUDIES, SAN DIEGO, CA
VIKING 1 LANDER, MOLECULAR ANALYSIS (75-075C-04)..... 8
VIKING 2 LANDER, MOLECULAR ANALYSIS (75-083C-04)..... 16

ORO, J. - U OF HOUSTON, HOUSTON, TX
VIKING 1 LANDER, MOLECULAR ANALYSIS (75-075C-04)..... 8
VIKING 2 LANDER, MOLECULAR ANALYSIS (75-083C-04)..... 16

OWEN, T. - STATE U OF NEW YORK, BUFFALO, NY
VIKING 1 LANDER, MOLECULAR ANALYSIS (75-075C-04)..... 8
VIKING 2 LANDER, MOLECULAR ANALYSIS (75-083C-04)..... 16

OYAMA, V.I. - NASA-ARC, MOFFETT FIELD, CA
VIKING 1 LANDER, BIOLOGY (75-075C-03)..... 7
VIKING 2 LANDER, BIOLOGY (75-083C-03)..... 16

POLLACK, J.B. - NASA-ARC, MOFFETT FIELD, CA
VIKING 1 LANDER, LANDER IMAGING (75-075C-06)..... 8
VIKING 2 LANDER, LANDER IMAGING (75-083C-06)..... 17

REASENBERG, R. - MASS INST OF TECH, CAMBRIDGE, MA
VIKING 1 LANDER, LANDER RADIO SCIENCE (75-075C-11)..... 11
VIKING 1 ORBITER, ORBITER RADIO SCIENCE (75-075A-04)..... 6
VIKING 2 LANDER, LANDER RADIO SCIENCE (75-083C-11)..... 20
VIKING 2 ORBITER, ORBITER RADIO SCIENCE (75-083A-04)..... 15

RICH, A. - MASS INST OF TECH, CAMBRIDGE, MA
VIKING 1 LANDER, BIOLOGY (75-075C-03)..... 7
VIKING 2 LANDER, BIOLOGY (75-083C-03)..... 16

ROSE, H.J. - US GEOLOGICAL SURVEY, RESTON, VA
VIKING 1 LANDER, INORGANIC ANALYSIS (75-075C-13)..... 11
VIKING 2 LANDER, INORGANIC ANALYSIS (75-083C-13)..... 21

RYAN, J.A. - CALIF ST U, FULLERTON, FULLERTON, CA
VIKING 1 LANDER, METEOROLOGY (75-075C-07)..... 10
VIKING 2 LANDER, METEOROLOGY (75-083C-07)..... 18

SAGAN, C. - CORNELL U, ITHACA, NY
VIKING 1 LANDER, LANDER IMAGING (75-075C-06)..... 8
VIKING 2 LANDER, LANDER IMAGING (75-083C-06)..... 17

SCOTT, R.F. - CALIF INST OF TECH, PASADENA, CA
VIKING 1 LANDER, PHYSICAL PROPERTIES (75-075C-01)..... 7
VIKING 2 LANDER, PHYSICAL PROPERTIES (75-083C-01)..... 16

SEIFF, A. - NASA-ARC, MOFFETT FIELD, CA
VIKING 1 LANDER, ENTRY SCIENCE ATMOSPHERIC STRUCTURE (75-075C-02)..... 7
VIKING 2 LANDER, ENTRY SCIENCE ATMOSPHERIC STRUCTURE (75-083C-02)..... 16

SHAPIRO, I.I. - MASS INST OF TECH, CAMBRIDGE, MA
VIKING 1 LANDER, LANDER RADIO SCIENCE (75-075C-11)..... 11
VIKING 1 ORBITER, ORBITER RADIO SCIENCE (75-075A-04)..... 6
VIKING 2 LANDER, LANDER RADIO SCIENCE (75-083C-11)..... 20
VIKING 2 ORBITER, ORBITER RADIO SCIENCE (75-083A-04)..... 15

SHORTHILL, R.W. - U OF UTAH, SALT LAKE CITY, UT
*VIKING 1 LANDER, PHYSICAL PROPERTIES (75-075C-01)..... 7
*VIKING 2 LANDER, PHYSICAL PROPERTIES (75-083C-01)..... 16

SMITH, B.A. - U OF ARIZONA, TUCSON, AZ
VIKING 1 ORBITER, ORBITER IMAGING (75-075A-01) 4
VIKING 2 ORBITER, ORBITER IMAGING (75-083A-01) 13

SODERBLOM, L.A. - US GEOLOGICAL SURVEY, MENLO PARK, CA
VIKING 1 ORBITER, ORBITER IMAGING (75-075A-01) 4
VIKING 2 ORBITER, ORBITER IMAGING (75-083A-01) 13

SPENCER, N.W. - NASA-GSFC, GREENBELT, MD
VIKING 1 LANDER, ENTRY SCIENCE ATMOSPHERIC STRUCTURE (75-075C-02) 7
VIKING 1 LANDER, ENTRY SCIENCE NEUTRAL ATMOSPHERIC COMPOSITION (75-075C-12) 11
VIKING 1 LANDER, ENTRY SCIENCE IONOSPHERIC PROPERTIES (75-075C-14) 12
VIKING 2 LANDER, ENTRY SCIENCE ATMOSPHERIC STRUCTURE (75-083C-02) 16
VIKING 2 LANDER, ENTRY SCIENCE NEUTRAL ATMOSPHERIC COMPOSITION (75-083C-12) 20
VIKING 2 LANDER, ENTRY SCIENCE IONOSPHERIC PROPERITES (75-083C-14) 21

STELZRIED, C.T. - NASA-JPL, PASADENA, CA
VIKING 1 LANDER, LANDER RADIO SCIENCE (75-075C-11) 11
VIKING 1 ORBITER, ORBITER RADIO SCIENCE (75-075A-04) 6
VIKING 2 LANDER, LANDER RADIO SCIENCE (75-083C-11) 20
VIKING 2 ORBITER, ORBITER RADIO SCIENCE (75-083A-04) 15

SUTTON, G.H. - U OF HAWAII, HONOLULU, HI
VIKING 2 LANDER, SEISMOLOGY (75-083C-08) 19

TILLMAN, J.E. - U OF WASHINGTON, SEATTLE, WA
VIKING 1 LANDER, METEOROLOGY (75-075C-07) 10
VIKING 2 LANDER, METEOROLOGY (75-083C-07) 18

TOKSOZ, M.N. - MASS INST OF TECH, CAMBRIDGE, MA
VIKING 2 LANDER, SEISMOLOGY (75-083C-08) 19

TOLSON, R.H. - NASA-LARC, HAMPTON, VA
VIKING 1 LANDER, LANDER RADIO SCIENCE (75-075C-11) 11
VIKING 1 ORBITER, ORBITER RADIO SCIENCE (75-075A-04) 6
VIKING 2 LANDER, LANDER RADIO SCIENCE (75-083C-11) 20
VIKING 2 ORBITER, ORBITER RADIO SCIENCE (75-083A-04) 15

TOULMIN, 3RD, P. - US GEOLOGICAL SURVEY, RESTON, VA
VIKING 1 LANDER, MOLECULAR ANALYSIS (75-075C-04) 8
*VIKING 1 LANDER, INORGANIC ANALYSIS (75-075C-13) 11
VIKING 2 LANDER, MOLECULAR ANALYSIS (75-083C-04) 16
*VIKING 2 LANDER, INORGANIC ANALYSIS (75-083C-13) 21

TYLER, G.L. - STANFORD U, PALO ALTO, CA
VIKING 1 LANDER, LANDER RADIO SCIENCE (75-075C-11) 11
VIKING 1 ORBITER, ORBITER RADIO SCIENCE (75-075A-04) 6
VIKING 2 LANDER, LANDER RADIO SCIENCE (75-083C-11) 20
VIKING 2 ORBITER, ORBITER RADIO SCIENCE (75-083A-04) 15

UREY, H.C. - U OF CALIF, SAN DIEGO, SAN DIEGO, CA
VIKING 1 LANDER, MOLECULAR ANALYSIS (75-075C-04) 8
VIKING 2 LANDER, MOLECULAR ANALYSIS (75-083C-04) 16

VEVERKA, J. - CORNELL U, ITHACA, NY
VIKING 1 ORBITER, ORBITER IMAGING (75-075A-01) 4
VIKING 2 ORBITER, ORBITER IMAGING (75-083A-01) 13

WELLMAN, J.B. - NASA-JPL, PASADENA, CA
VIKING 1 ORBITER, ORBITER IMAGING (75-075A-01) 4
VIKING 2 ORBITER, ORBITER IMAGING (75-083A-01) 13

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APPENDIXES

APPENDIX 1 - NSSDC FACILITIES AND ORDERING PROCEDURES

NSSDC PURPOSE AND ORGANIZATION

The National Space Science Data Center (NSSDC) was established by the National Aeronautics and Space Administration (NASA) to provide data and information from space science experiments in support of additional studies beyond those performed by principal investigators. Available and expected Viking data are announced in this *Catalog*. Data available from NSSDC in other disciplines (see inside front cover) comprise additional published catalogs or catalogs to be published in the near future. In addition to its main function of providing selected data and supporting information for further analysis of space science flight experiments, NSSDC produces other publications. Among these are a report on active and planned spacecraft and experiments and various users guides.

Virtually all the data available at or through NSSDC result from individual experiments carried on board individual spacecraft. The Data Center has developed an information system utilizing a spacecraft/experiment/data identification hierarchy. This *Catalog* is based on this information system, and additional program information has been provided.

NSSDC FACILITIES AND SERVICES

NSSDC provides facilities for reproduction of data and for onsite data use. Resident and visiting researchers are invited to study the data while at the Data Center. The Data Center staff will assist users with additional data searches and with the use of equipment. Advance notice of such a visit enables the staff to provide better services to the data user. In addition to satellite data, the Data Center maintains some supporting information and other supporting data that may be related to the needs of researchers.

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DATA AVAILABILITY, COSTS, AND ORDERING PROCEDURES

The services provided by NSSDC are available to any individual or organization resident in the United States and to researchers outside the United States through the World Data Center A for Rockets and Satellites (WDC-A-R&S). Normally a charge is made for the requested data to cover the cost of reproduction and the processing of the request. The researcher will be

notified of the charge, and payment must be received prior to the processing of the request. However, as resources permit, the Director of NSSDC/WDC-A-R&S may waive the charge for modest amounts of data when they are to be used for scientific studies or for specific educational purposes and when they are requested by an individual affiliated with: (1) NASA installations, NASA contractors, or NASA grantees; (2) other U.S. Government agencies, their contractors, or their grantees; (3) universities or colleges; (4) state or local governments; or (5) nonprofit organizations.

A researcher may obtain data described in this *Catalog* by a letter or telephone request, an onsite visit, or the NSSDC/WDC-A-R&S Order Form for Viking Mission Data that accompanies this *Catalog*. This form enables a requester to order: (1) documentation that will facilitate ordering specific data and (2) specific data where definitive information can be obtained from this *Catalog*. Anyone who wishes to obtain data for a scientific study should specify the NSSDC identification number, the name of the experiment, the form of the data, and the time span (or location, when appropriate) of interest. A researcher should also specify why the data are needed, the subject of his work, his affiliation, and any Government contracts he may have for performing his study.

NSSDC would also appreciate receiving copies of all publications resulting from studies in which data supplied by NSSDC have been used. It is further requested that NSSDC be acknowledged as a source of the data in all publications resulting from use of the data provided.

Data can be provided in a format or medium other than that noted in the data descriptions. For example, magnetic tapes can be reformatted, computer printout or microfilmed listings can be reproduced from magnetic tape, enlarged paper prints can be produced from data on photographic film and microfilm, etc. The Data Center will provide the requester with an estimate of the response time and, when appropriate, the charge for such requests. When requesting data on magnetic tape, the user should specify whether he will supply new tapes prior to the processing, return the original NSSDC tapes after the data have been copied, or pay for new tapes.

The Data Center's address for requests is:

National Space Science Data Center
Code 601.4
Goddard Space Flight Center
Greenbelt, Maryland 20771
Phone: (301) 982-6695

Researchers who reside outside the U.S. should direct requests for data to:

World Data Center A for Rockets and Satellites
Code 601
Goddard Space Flight Center
Greenbelt, Maryland 20771 U.S.A.
Phone: (301) 982-6695

Because the World Data Center A for Rockets and Satellites (WDC-A-R&S) also maintains listings of rocket experiments, requests for information concerning rocket launchings and experiments may be directed to this institution.